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EDITORIAL.

The Ethics of Consultation.

THE most notable event in medical circles is the new code of ethics of the Medical Society of the State of New York, adopted in February, the remarkable feature of it being the declaration that:

"Members of the Medical Society of the State of New York and of the medical societies in affiliation therewith may meet in consultation legally qualified practitioners of medicine. Emergencies may occur in which all restrictions should, in the judgment of the practitioner, yield to the demands of humanity."

Those who are familiar with codes of ethics have for some years appreciated the fact that it would be practically impossible to convict any physician of a violation of the system of ethics of the State Society or of the code of the American Medical Association in the matter of consultations. In 1878, the Medical Society of the County of New York requested of the State Society that it would more clearly define the Fourth Article of the National Code, the concluding portion of which reads as follows:

"But no one can be considered as a regular practitioner or a fit associate in consultation whose practice is based on an exclusive dogma, to the rejection of the accumulated experience of the profession, and of the aids actually furnished by anatomy, pathology, and organic chemistry."

The State Society at that time declined to give a clearer explanation of the section unless an individual case be cited. Further consideration of the matter has probably convinced the Society that the code, as it stands, does not apply to the conditions of this period, and the new code here referred to is the result.

Much is being said about the probable effect of this action on the part of the State Society upon the standing of its delegates and of those going from the County Societies, in the American Medical Association, and it has been intimated that they may be denied admission. We can hardly believe that the Association will be likely to act so arbitrarily, or that it will fail to recognize the fact that, whether it agrees entirely with the spirit of the new code or not, some modification of its own code will be obligatory if it aspires to be a representative body for the profession of the whole country.

The code of the National Association has for many years been the subject of severe criticism, both here and abroad. Attempts to enforce its provisions have mainly served to show its errors and its unfitness for the conditions of medical practice now existing. We believe that this action by the State Society will be found to express the conviction of a majority of the physicians in the State as to what is feasible and proper at the present time, and not, as has been asserted, the wishes of a few specialists who yearn for a larger field from which they may draw consultation practice.

We have no doubt that when the matter is duly considered by the National Association, the question whether the Association shall adhere to its present code, at the expense of losing its representative character, or continue to be a National Association, and change its antiquated code to suit the requirements of the time will result in the adoption of the latter course.

DR. BILLINGS, of Washington, in a recent address to the graduating class of Bellevue Hospital Medical College, said a very good thing when, speaking of their future professional relations, he remarked that in the matter of ethics their first duty would be for each to look after his own ethics before he gave himself much trouble about the ethics of his neighbor.

IN connection with this subject, it may not be entirely out of place to refer here to the extent to which certain members of the American Medical Association have of late years given certificates of the medicinal virtues of secret remedies, wines, food preparations, mineral waters, etc., which certificates, with an enumeration of the professional positions held by their writers, have been used for public advertisement with the knowledge and consent of their makers. This has been done in the case of articles the true nature and composition of which is not generally known, or, if known to the persons who certified at the time of their writing, there could have been no guaran tee that the articles would remain the same, or that having once acquired a reputation (in part through the value of such certificates) their composition would not be altered in

the interests of the manufacturer rather than of the consumer.

The motive for giving such certificates can readily be inferred to be a desire to secure an advertisement in the public prints in such a manner as to invite "the attention of individuals affected with particular diseases," and in other ways to evade the provisions of Section 3 of Article I. of the code relating to "*Duties for the Support of Professional Character.*"

The manner in which the Association has of late years ignored the existence of this growing evil, while devoting hours to discussions and resolutions about the right of women to practise medicine, or of medical colleges to grant diplomas to students who might, after graduation, exercise the right to give their patients such remedies as they considered most likely to expedite recovery, is a most remarkable instance of ethical strabismus, and reminds one of "straining at a gnat and swallowing a camel."

Novel Reactions of Milk.

If a little tincture of guaiac is added to fresh milk, a blue color is produced. Milk heated to 80° C. (176° F.) or upwards remains uncolored. Sour milk takes the same tint, but the reaction is prevented by the addition of mineral acids and alkalies. If a little starch paste, mixed with potassium iodide, is added to the milk which has been mixed with old oil of turpentine, a fine blue band appears at the surface of contact and spreads rapidly. Milk freed from albuminous matter does not give this reaction. If to fresh milk there is added first acetic acid to precipitate the casein, then some caustic potassa, and lastly a trace of solution of copper sulphate, the violet reaction characteristic of peptone does not appear, but if the milk is allowed to stand fifteen to twenty hours before this treatment, the violet color is obtained. The author considers the blue color due to ozone.—C. Arnold, *Journ. de Pharm. et de Chim.*, September, 1881, and *Chem. News*, February 5th, 1882.

Antimerulion.

Dr. Zerener has given this quasi-classical name to a preparation much used and recommended abroad for preventing mould, mildew, and dry-rot. When properly employed it hinders the appearance of dry-rot (*Merulius destruens*), and serves to destroy it. The substance is made in three forms. The liquid preparation of 30° B. is made of boracic acid, common salt, and silica, and is applied by means of a brush or pencil to woodwork and masonry. In factories where moist fumes and vapors are evolved, which favor the production of mould and fungus, this acts as a protection for the building. The so-called doubly prepared antimerulion consists of infusorial silica, with the addition of twenty per cent of boracic acid; it is to be scattered in moist or damp places. The simple dry antimerulion contains, besides the infusorial earth, only eight per cent of boracic acid, is less active, and used specially for protecting moist places from mould, for insulating material, and to exclude the atmospheric air and terrestrial warmth—that is for ice cellars, ice chests, water pipes, and heating arrangements. In places where mould and dry-rot are feared, the dry antimerulion is packed in. It is better to expose these places to the air and paint thoroughly with the liquid substance, and then repeat the application annually. The two first-named substances are furnished by the chemical factory of G. Schallehn, in Magdeburg, at 57 cents per 100 pounds, and the last-named, or solid compound, at half its price.

The name, of course, is derived from *Merulius*, a kind of dry-rot or fungus against which it claims to be a specific.

[Original Communication.]

The Production of Peppermint Oil.

During a recent visit of the Editor to Wayne County, in this State, an opportunity occurred for obtaining information respecting the production of peppermint oil in that region. It is now upwards of fifty years since peppermint was first cultivated in that locality for its oil, the first attempt in the business in this country having been made in Massachusetts. For many years it has also been grown in a few counties in Ohio and in some parts of upper Canada (Ontario). Its growth in Michigan was first undertaken in 1855, and has since steadily increased. Western New York, however, produces the largest quantity of oil, and it is said that the products of that region are characterized by a finer aroma than that produced in most other localities in this country. Of late, growers and refiners have devoted special attention to the selection of the best varieties of the plant and to the quality of the product. In Wayne County alone, more than 3,000 acres of mint are cultivated annually, with an average yield of about 20 pounds of oil to the acre, or a total yearly production of over 60,000 pounds.

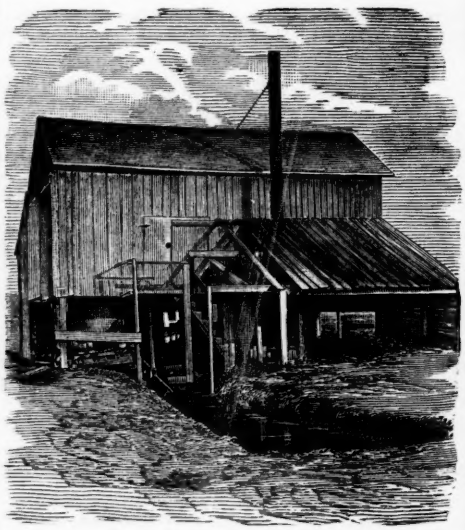


Fig. 1.—View of a building used for distilling peppermint. The worm is shown as entering the stream from the front of the distilling vat. The lengths of pipe (not shown in the engraving) are led up and down the stream and finally discharge the oil and condensed steam below the dam.

At different times the magnitude of the business and the limited area within which it is carried on have led to extensive speculations. At one time the production of the entire county was controlled by a single firm who contracted with the large growers to discontinue the raising of mint for five years.

Todd, in the *Proceedings of the Am. Pharm. Asso.* for 1876, page 828, estimates the annual production of oil of peppermint throughout the world as about 90,000 pounds, which would show that by far the largest portion—certainly two-thirds—comes from the Wayne County, N. Y., region. At Mitcham, in Surrey, England, about two hundred acres are devoted to this crop, and owing probably to the peculiarities of climate, soil, and in part to the variety of peppermint cultivated, the product is of especial excellence. Some peppermint is also distilled in Germany, in the region about Leipzig, and in France, in the department of the Yonne, and in Southern India.

In China and Japan, the peppermint oil there produced is characterized by the large proportion of the stearoptene, menthol, or peppermint camphor. In China, the *Mentha*

javanica Bl. is the plant commonly cultivated, and its product consists almost entirely—so it is said—of this camphoraceous substance.

When ordinary peppermint oil is cooled 8° F. below zero, hexagonal crystals of menthol are sometimes separated, leaving a fluid substance the chemical composition of which is not yet well understood. In England, two varieties of mint are employed, called the "black" and "white" mints. There are few botanical characteristics published by which the two varieties can be distinguished, except that the former is usually much the coarser plant, and its stems are more tinged with purple; it flowers somewhat later, and the oil it affords is more abundant but less valued.* The stems of the *white mint* are green, and its leaves are rather more coarsely serrated than those of the "black" variety.†

Peppermint should be grown on a warm, rich soil, which is not too dry, since it produces plants which are too small. On the other hand, the plants grown on a wet soil fail to produce oil in paying quantities. Gravel or clay are, therefore, unsuitable soils. The land should be well ploughed as late in the fall as possible, and either cross-ploughed or thoroughly pulverized in some other manner. Early in the spring the land should be laid off in furrows twenty-four to thirty-six inches apart, and "sets" or portions of the roots of old plants are to be thickly placed in the furrows, and covered lightly.

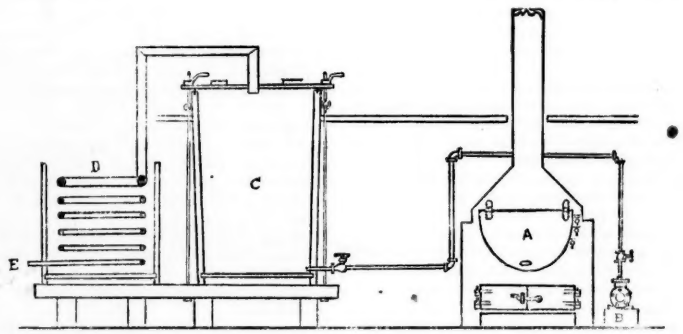


FIG. 2.—Diagram of apparatus for distilling peppermint. A, steam boiler; B, pump for supplying the boiler with water and, if need be, for furnishing water to the worm-tank; C, still; D, worm and worm-tank; E, end of worm from which condensed steam and oil are discharged. The top of the vat passes through the floor above, from which the peppermint is introduced and into which it is removed when exhausted of oil.

The plants must be kept free from weeds until they cover the surface of the soil, which they will do completely by the second year. Many of the cultivators of peppermint on the rich bottom lands of the Ganargua Creek of Wayne County are German, and men, women, and children may often be seen in the fields in the season engaged in cultivating the crop.

The harvest commences early in August or as soon as the plant is in flower (by which time it will have attained a height of about two feet or upwards), and continues into September; warm or hot weather being essential at harvest time that the plant may produce oil abundantly. The first crop is the best; the crop of the second year less desirable, and on the third year the ground may be again ploughed, and the crop allowed to spring up from the broken roots. The yield in the third year, when the ground is treated in this manner, is somewhat less than that of the first year. After this, the land should be devoted for a time to some other crop. Not only is the yield most abundant the first year, but the crop is more free from weeds than during the subsequent years, and the oil is correspondingly purer. The weed which causes most trouble is the *Erechtites hieracifolia* Raf., otherwise known as "broom-weed," "mare's-tail," "fire-weed," etc., a composite (like lettuce) yieding a volatile oil which is bitter and pungent, and by its presence impairs the naturally fresh, penetrating, and delicious taste of the pure oil of peppermint.

The mint is cut with a sickle, scythe, two-fingered cradle, or mowing machine, according to the option or carefulness of the cultivator. It is then allowed to wilt in the sun for five or six hours, and then is raked into "cocks," where it is allowed to remain a short time before being distilled. This process is found to give a larger yield of oil and to improve the color of the product.

Not every cultivator is provided with a still; but such appliances are found distributed about the region at accessible distances. Some are of the most primitive character, while others are constructed more elaborately. The apparatus and method differ from that employed in Europe, where the fire is applied to the still. In this country, the still consists of a wooden tub or vat of heavy staves hooped with iron, and of a size to correspond with the amount of steam furnished by a boiler. The vats seen by the writer were four to five feet in diameter and twice as deep.

The wilted mint is packed into the vat by treading with the feet until the vat is full, when a cover, made steam-tight with rubber-packing, is fastened down with screw-clamps. A steam-pipe connects the lower part of the vat with a steam boiler, and another pipe from the centre of the cover connects the vat with the condensing worm. The latter varies in size according to the capacity of the still, but becomes progressively smaller towards the outlet. The worm is so placed as to have a constant stream of cold running water surrounding it. The steam from the boiler being admitted to the vat at a pressure of thirty to forty pounds, the oil of the mint is volatilized and mixed with the steam it is condensed in the worm. The mixed oil and water are collected in the receiver, where the difference in their specific gravity causes them to separate. In many instances, the receiver is a tin vessel, with a small pipe opening from its lower part and ascending nearly to the top, where it turns outward. The weight of the oil causes the water in the lower part to ascend in the discharge-tube until it overflows from the pipe. In the mean time, the oil is dipped from the vessel whenever a few pounds have accumulated. No attempt is made to redistill the water which separates, and a considerable loss of oil, which is held in solution, doubtless results from this lack of economy. The oil is packed in tin cans or glass demijohns, holding about twenty pounds each. The glass demijohns are much the best where the oil is to be kept any length of time, as its good qualities are more fully retained, and it is less liable to discoloration. From the oil thus produced, the refiners and exporters make their selections, and upon their judgment in selecting, skill in refining, and their honesty.

* Medicinal Plants by Bentley and Trimen. Philadelphia: Lindsay & Blakiston, 1880.

† Pharmacographia [2], 484.

as well as the care used in excluding foreign plants from the crop, depends the quality of the oil found in the market. It is very probable that most of the adulteration which the oil undergoes takes place after it has left the hands of the original refiners and dealers. At the present time, Wayne County, N. Y., grows, refines, and exports the greater quantity of all the oil of peppermint grown in the United States and Canada.

The principal firms who buy the oil of the growers and refine it and place it in the market are H. G. Hotchkiss, of Lyons, N. Y., who for many years has been engaged in the business; A. S. Hale, of Lyons; L. B. Hotchkiss, of Phelps, and Pierson and Perkins, of Newark. The latter firm are also growers and distillers of peppermint, and have lately introduced from England new and improved methods and appliances in distillation and manufacture which insure the purity of their productions.

Oil of peppermint is sometimes adulterated with turpentine and also with oil of hemlock. Pure oil of peppermint as exported from Wayne County is colorless, and resembles the English oil, except that its odor and taste are somewhat less pungent and penetrating. The oil deteriorates with age, and the aroma becomes more faint. After a certain number of years, it thickens, and the color becomes of a yellowish tinge. Exposed for a long time to air, it becomes resinous.

The first illustration is intended to show the actual appearance of one of the numerous stills to be found in the region where the mint is grown, being made from a photograph; the other is a diagram of the general arrangement of the apparatus used. In some instances the boiler is used for supplying power for other purposes when not required for distilling. In one building cider and wine making, feed cutting and grinding, box making, wood sawing, corn shelling, and other industries were from time to time carried on, so that the actual cost of distilling the oil was very considerably diminished, and the steam apparatus could be made to yield a good revenue.

In every case two vats or still-tubs were arranged side by side, so that the process of distilling could proceed in one while the other was being emptied and refilled. The exhausted mint is taken out with forks and dried for fodder, and we observed that some which had been kept from last year's crop had an aroma resembling well-cured hay. Cattle of all kinds prefer it to other fodder, but they will not touch the green herb. This fact is sometimes taken advantage of by turning sheep into a field of mint in order that they may clear it of grass.

The worm for condensing the vapor from the still is usually made of ordinary tinned plate iron, such as is used for domestic utensils, and from its commencement at the cover of the vat to its further extremity it gradually diminishes in size from two and a half or three inches to about one inch. The simplest mode of arranging the condenser is to lead it back and forth by means of angles, through a running stream, as shown in the first illustration, where a rivulet crossing the roadway passes under the still-house, and the water being dammed by means of a board, a space is left below the dam where the collecting-vessel can be set In the second illustration the worm is represented as coiled in a vat of planks, cold water being pumped into it by steam or by means of a hydraulic ram. The same worm serves for either still.—Ed. N. R.

Filtering Paper Pulp.

R. de Puy directs to prepare filtering paper pulp in the following manner:

Place any amount of paper (filtering paper is not necessary, though it is the best) in a mortar, or other vessel, upon which pour enough solution of soda or potassa to very thoroughly wet it, stir it with a pestle or stick until it is reduced to a pulp, which will only take a minute or two, then add cold water, stir, throw upon a calico filter, let drain, and wash with water until all traces of the alkali are washed out. By this process any amount of pulp can be prepared in a very short time, and can be put in wide-mouthed bottles for future use.—*Canad. Pharm. Journ.*, xv., 3.

[Original Communication.]

Syrup of Hydriodic Acid.*

BY EDWARD R. GODDING, PH.G.

There have been a number of processes mentioned for the preparation of hydriodic acid: the first of these which I tried was that known as Buchanan's. This consists in dissolving 264 grains of tartaric acid and 330 grains of iodide of potassium, each in one and a half (1½) ounces of water, then mixing these two solutions, and straining or filtering to separate the precipitate of bitartrate of potassium formed by the union of the two solutions, adding water enough to make the filtrate measure six and one-fourth (6¼) fluid ounces. I found this liquid to turn red in less than twenty-four hours, showing the liberation of free iodine. This solution contains about eight per cent of hydriodic acid.

The next process which I tried was a modification of the above. I took 209¾ grains of iodide of potassium, 190¼ grains of tartaric acid, dissolved each in one (1) ounce of water, filtered each of these solutions, mixed them, introduced them into a bath of ice-cold water, allowed them to stand one hour, and then filtered.

The next process that I used was that formerly officinal in the United States Pharmacopœia, namely: Iodine, 480 grains; water, six fluid ounces. Take thirty grains of the iodine, put it into the water, pass a stream of sulphuretted hydrogen through it until all the iodine has disappeared, then keep adding the remaining 450 grains of iodine in successive portions, until it is all dissolved and a clear liquid remains with a precipitate of sulphur. This liquid is boiled until the odor of the sulphuretted hydrogen has all passed away, then it is filtered to separate it from the sulphur, and the filter washed with distilled water until the filtrate measures six (6) fluid ounces.

After making the acids, I experimented to get a permanent acid to make a syrup, and hyposulphite of sodium was suggested as a preventive to keep the acid from liberating free iodine, and also to reclaim an acid that had already liberated a portion.

This is done as follows: a solution of hyposulphite of sodium is made, containing one (1) drachm of the hyposulphite to an ounce of water, and it is stated that five (5) drops were sufficient to reclaim two (2) ounces of highly colored acid.

Buchanan's acid was treated with the solution of hyposulphite of sodium, one drop being used to each ounce.

This was made March 4th, 1881, but, upon standing, precipitated. I also added five (5 drops to an ounce of the same acid, getting a more perceptible precipitate, which proves that the solution of hyposulphite of sodium will not make Buchanan's acid permanent. The acid made by the second process was treated by adding two (2) drops of the solution of hyposulphite of sodium to one-half (½) an ounce of the acid, but it still remains colored.

The acid obtained by the third process was treated with three 3) drops of the solution of hyposulphite of sodium to one 1) ounce of the acid, and it turned milky, showing the formation of a precipitate.

I then commenced making the syrups. The first made was from Buchanan's acid, as follows:

Hydriodic acid ..... ℥ i.
Rock candy ..... ℥ iss. M.

Dissolved by agitation. The solution had a yellow color and remains unchanged up to time of writing.

To two (2) ounces of syrup made with Buchanan's acid like the above, I added five (5) drops of the solution of hyposulphite of sodium, and it became milky and remains so, showing that hyposulphite could not be used with this syrup to make it permanent.

The next syrup was made with a portion of the acid of second process, formula same as above, with about the same result. To one ounce of this syrup I added three (3) drops solution hyposulphite of sodium, and it became very clear.

* Abstract of a Thesis presented to the Massachusetts College of Pharmacy.

Azor Thurston.

With the last syrup made, from the acid by the sulphuretted hydrogen process, I proceeded thus:

Hydriodic acid..... ℥i.
Rock candy..... ℥iss.

M. Upon standing, this becomes red. On March 4th, 1881, I added to one (1) ounce of the above syrup three (3) drops of a solution of hyposulphite of sodium, when it became perfectly clear.

I also mixed one-half (½) ounce acid made by last process with one-half (½) ounce of glycerin and allowed the mixture to stand; it became red. I then added to this four (4) drops of a solution of hyposulphite of sodium, and it became colorless. I then took eighty (80) minims of hydriodic acid made by the third process, one (1) fluid ounce of water, one and a half (1½) ounces of rock candy, allowed it to stand until dissolved, then filtered, and took one-half (½) ounce and exposed it to direct sunlight for seven (7) days, and it remains unchanged.

This represents forty (40) minims of hydriodic acid to one (1) ounce of syrup, the same strength as that made by Robert W. Gardner, of New York.

The syrup obtained by mixing one-half ounce acid with one-half ounce glycerin, and adding four drops of a solution of hyposulphite of sodium on the 17th of February, 1881, was found on March 8th, 1881, a period of nineteen days, to be free from cloudiness or coloration.

It has been asserted that hyposulphite of sodium in solution has the advantage of preserving and reclaiming the acid when colored, but my experiments have failed to prove this assertion.

A Case of Poisoning by Resorcin.

DR. WILLIAM MURRELL, Lecturer on Materia Medica and Therapeutics at Westminister Hospital, London, has published the account of an almost fatal case of poisoning by resorcin—the first on record, we believe—given as a remedy for spasmodic asthma. The patient was a female, and she had taken, without avail, a "line" of drugs, as long as the list of ships in Homer. Arsenic, belladonna, ipecacuanha, Grindelia robusta, iodide of potassium, citrate of caffeine, stramonium, Datura Tatula, jaborandi, pilocarpine, Jamaica dogwood, quebracho, aspidospermine, nitrite of amyl, nitroglycerin, iodide of ethyl, pure terebene, hypodermic injections of morphine and atropine, nitre papers and tablets, cubeb cigarettes, Himrod's powders, and Green-Mountain powder, or twenty-eight in all, to say nothing of sprays and inhalations without end. At last, Dr. Murrell tried resorcin in doses gradually increasing from a drachm to two drachms, when well-marked symptoms of poisoning set in. The first doses were impure, and consequently not so active as the last dose, which was almost perfectly pure. The patient's life was luckily saved by the use of emetics and the stomach-pump. The first doses were evidently contaminated with carbolic acid, which no doubt contributed to bring about the nearly fatal effect. The general symptoms seem to have greatly resembled those of poisoning by carbolic acid.—*The Chem. Journ.*, 1881, Dec. 9th.

American Antimony.

A BALTIMORE dispatch informs us that a carload of antimony, ten tons in all, was lately received by C. L. Oudesluys & Co., from the southern part of Utah Territory, being the first antimony received in the East from the mines of that section. The antimony was mined about one hundred and forty miles from Salt Lake City. The ore is a sulphide, bluish-gray in color, and yields from sixty to sixty-five per cent of antimony. All antimony heretofore came from Great Britain and the island of Borneo, and paid an import duty of ten per cent ad valorem, and there is also some from Sonora. It is believed that with proper rail facilities to the mines of the West there will be no need of importations.

[ORIGINAL COMMUNICATION.]

Hydrobromic Acid.*

BY G. R. TUCKER, PH.G.

THE credit of having introduced hydrobromic acid as a medicine is generally given to Dr. J. Milner Fothergill, who extolled its virtues in the *British Medical Journal*, and gave a process for its preparation, viz.: by the decomposition of potassium bromide by tartaric acid.

Dr. De Witt C. Wade has also written much of value on the subject, and in the *Peninsular Journal* for February, 1875, gave an account of its action, and a formula for its preparation, correcting certain inaccuracies in that of Dr. Fothergill. This acid is now quite extensively used, and is considered of sufficient importance to merit a place in our next Pharmacopœia. It is certainly desirable to have a process that will not be too difficult of execution, and one yielding uniform results, of such purity as we expect to find in pharmacopœial products.

In regard to the formula of Dr. Wade, all that can be said in its favor is simplicity. If correctly proportioned, we can perhaps avoid either an excess of bromide or of tartaric acid, but we always get a not inconsiderable amount of potassium bitartrate along with it.

Methods have been proposed to obviate this objection, the most successful being that proposed by Dr. Charles Rice, which consists in precipitating the cream of tartar by alcohol. This yields a reasonably pure product, but detracts from the simplicity for which the process has been recommended, making it tedious and expensive. Dr. Rice's formula is as follows:

Dissolve 1,191 grains of potassium bromide in 15 fluid ounces of water, add 1,500 grains of powdered tartaric acid, heat, and set aside in a cool place for twenty-four hours. 32 ounces of alcohol is then added, and the mixture again allowed to rest for twenty-four hours, after which it is filtered, and the alcohol evaporated or recovered by distillation. The product should measure 16 fluid ounces. Sp. gr. about 1.075, containing 10% of HBr.

Dr. Wade claims that the slight amount of cream of tartar taken up is of no consequence, as it in no way interferes with its medicinal qualities. However true this may have been at the time of Dr. Wade's article, it cannot apply now, in view of the uses to which the acid may be applied, as, for example, in the preparation of hydrobromates of organic bases, which are coming somewhat into use, as hydrobromates of quinia, cinchonia, morphia, strychnia, etc.

For the extemporaneous preparation of bromides, there is no process more satisfactory than the saturation of a strong aqueous hydrobromic acid, with an oxide or carbonate of the base required. The pharmacist can in this way prepare bromides or hydrobromates, which he may be called upon to dispense, and for which the demand is so slight that it is not an object to purchase.

Various modes of preparation have supplied the market, up to the present time, with acid of various and commonly unknown strengths; hence, as might reasonably be expected, the experiences in regard to its utility are confused, and often conflicting. Physicians prescribe such articles, and pharmacists buy and dispense them, too often as if there could be but one thing supplied; for example, physicians prescribe hydrobromic acid, not knowing that it may be of any strength from one to fifty per cent, although substituting it for bromide (KBr.). It is true that the dose cannot be determined by the quantity of bromine present in the acid, yet there is doubtless some relation which, when studied, forms the basis for its use. It being now generally established that it is the bromine element which is effective in all the bromides, hydrobromic acid should be adjusted in strength, so as to bear some easily remembered relation of its bromine constituent to the potassium salt, this being the one most commonly used.

Potassium bromide contains 67.22 per cent of bromine; sodium bromide, 71.4; and ammonium bromide, 81.6; that

* Abstract of a thesis presented to the Massachusetts College of Pharmacy.

is, 20 grains of the potassium is equal to a dose of 18.8 grains of the sodium, or 16.5 grains of the ammonium salts. Potassium bromide containing in round numbers sixty-seven per cent of bromine, a solution of hydrobromic acid containing also sixty-seven per cent of bromine would have the same bromine value.

The most convenient and simple relation is to have an acid of 33.5 per cent of bromine, or 34 per cent of hydrobromic acid, or half the strength of the potassium salt; such an acid can be made and dispensed without difficulty, while an acid of 67 per cent would be inconvenient to dispense, being strongly corrosive, fuming in the air even more than hydrochloric acid.

This strength is a convenient one to remember, as compared with potassium bromide, being in proportion of two to one. Hydrobromic acid is a sedative neurotic, and its principal use appears to be as a substitute for potassium, sodium, and ammonium bromides. It is well known that salts of the alkalies, when given for a long time, are apt to produce undue alkalinity. To correct this, and to forestall against it when likely to occur, this acid finds its principal use. It also acts like other mineral acids in being tonic, refrigerant, solvent, alterative, etc.; combined with quinia, it is said to be very satisfactory in intermittent fever, and has been highly spoken of as a corrective and preventive remedy for headache and ringing in the ears, which often follows upon the use of salts of quinia, called "quinism." Various combinations have been recommended from time to time with drugs, such as mercury, stramonium, digitalis, bismuth, pepsin, tartar emetic, etc., but the advantages claimed for these combinations have not been satisfactorily established.

Hydrobromic acid is not, like hydrochloric acid, readily formed by direct union of its elements; mixtures of bromine vapor and hydrogen do not unite by direct exposure to sunlight, nor do they explode when brought into contact with flame, but combination does take place in the immediate neighborhood of a red-hot wire, when introduced into it, and more quickly when the mixture is passed through a red-hot tube, or by platinum wire, if kept hot by the galvanic current. [A new and convenient process for preparing the acid by passing the vapors of bromine and hydrogen over red-hot platinum is described in our February number, page 43.—ED. N. R.] It is rapidly and copiously absorbed by water, which, when saturated, has a density of 1.29, and fumes strongly in air; this saturated solution boils at a temperature below 100° C., giving off the gas and becoming weaker; a more dilute acid boils at a temperature above 100° C., and a very dilute acid becomes stronger by boiling. The gas is not decomposed by heat alone; potassium introduced into it decomposes it completely, forming potassium bromide, and leaving a volume of pure hydrogen equal to half that of the original gas. Tin produces the same effect when aided by a gentle heat. This reaction can be used to determine the composition of the gas, for the weight of one volume of the gas (the observed sp. gr.), diminished by the weight of one-half the volume of hydrogen, gives a number which is very nearly half the sp. gr. of bromine, 5.54; hence the gas is composed of equal volumes of hydrogen and bromine, united without condensation. The gas or its aqueous solution is immediately decomposed by chlorine, hydrochloric acid being formed and bromine separated, which is recognized by its red color. Iodine, on the contrary, does not decompose it, hence the affinity of bromine for hydrogen is, under similar circumstances, less than that of chlorine, and greater than that of iodine. The acid is also decomposed by oxygen and by highly oxydized bodies.

Nitric acid separates bromine on heating the liquid, and a mixture of these acids has the power of dissolving gold. Sulphuric acid decomposes it, yielding sulphurous acid, bromine, and water

$$2HBr + H_2SO_4 = SO_2 + 2H_2O + Br_2$$

with bromic acid it yields water and free bromine.

Many formulæ have been proposed for making this acid for medicinal use, but all so inaccurate, or inconvenient, or difficult, as to be impracticable for ordinary use. The process usually noticed in the older works on chemistry is that of Balard, and as modified by Prof. J. M. Maisch, and still farther by Prof. G. F. H. Markoe, is on many accounts to be preferred to any that have been proposed. Goebel's process* consists in decomposing a solution of barium bromide by sulphuric acid, but this process, although a good one, is inconvenient, as it renders necessary the previous preparation of barium bromide. Loewig tells us to distill potassium bromide with sulphuric acid; a purer product can be obtained by using phosphoric acid in a concentrated form. If calcium hypophosphite be placed in a retort with water, and bromine added through a funnel-tube, hydrobromic acid will be formed immediately, without the aid of heat; the water being decomposed, furnishes the hydrogen necessary to convert the bromine into HBr, while the oxygen changes the calcium salt to a neutral phosphate. The proportions are: water, 1 part; bromine, 5 parts; and calcium hypophosphite, 4 parts. Sodium sulphite could be substituted to good advantage, but will require a slight heat. The salt in this case becomes a sulphate, and the proportion would be: water, 1 part; bromine, 3 parts; sodium sulphite, 6 parts, yielding 10 parts of acid. In making monobromated camphor, one-half the bromine is converted into HBr, and may be readily obtained as such by passing the gas into water.

A new method has been developed from the known fact that bromine associates itself with certain organic bodies at ordinary temperatures, and is again liberated on heating in form of hydracids; essential oil of copaiba and lemon have been used as a medium for this purpose.

A very interesting and instructive process is that by which hydriodic acid is prepared, and with a modification noticed in NEW REMEDIES, 1880, page 5, answers admirably for hydrobromic acid. When hydrosulphuric acid is passed into iodine or bromine, hydriodic or hydrobromic acid is formed and sulphur precipitated; when iodine is used, the sulphur persistently envelops it, preventing further action; but if carbon disulphide be used, this difficulty is entirely obviated, it being a solvent for iodine, bromine, and sulphur. The most suitable proportions are: carbon disulphide, three parts; bromine, two parts; distilled water, eight parts; yielding an acid of about the spec. gr. 1.090.

Dissolve the bromine in the carbon disulphide, pour this solution into a tall glass cylinder, cover it with the water, and then by means of a delivery tube, reaching to the bottom of the cylinder, pass a stream of sulphuretted hydrogen to the liquid, till the bromine is all converted into hydrobromic acid, which will dissolve without loss in the water. The reaction is known to be finished, when the liquid loses its deep-red color. Then separate the aqueous solution of HBr; boil to expel sulphuretted hydrogen and filter. The rationale is extremely simple, the reaction takes place when sulphuretted hydrogen comes in contact with bromine; one equivalent of hydrogen unites with one of bromine to form hydrobromic acid, while the sulphur with which it was combined is isolated, and remains dissolved in the carbon disulphide. In the report compiled by Dr Charles Rice, on the Revision of the United States Pharmacopœia, a place is given to the process of Dr. Squibb, but it is yet to be decided whether that, or the excellent process of Prof. Markoe will be adopted. In 1875, Prof. Markoe introduced his process, which has been extensively used, as it is by far the most economical and especially adapted to manufacture on a large scale. The mode of procedure is as follows: One pound of phosphorus is placed in a one-gallon jar, (stoneware) covered with water, and the jar half filled with ice, a large funnel is then inserted into the throat of the jar, and a funnel tube adjusted so as to reach a short distance above the phosphorus, the funnel is filled with ice, and the apparatus placed in a vessel, that the jar may be surrounded with ice; three or four pounds of bromine may now be very slowly added through the funnel tube, waiting after each addition until the reaction has ceased; large quantities would give rise to an explosion. The two ele-

* NEW REM., 1880, 262.

ments unite to form pentabromide of phosphorus, PBr_5, and this reacting with water, forms phosphoric and hydrobromic acids:

$$PBr_5 + 4H_2O = H_3PO_4 + 5HBr.$$

After the reaction is completed, the excess of phosphorus is removed, and the aqueous liquid distilled until hydrobromic acid ceases to come over. The syrupy residue left in the retort, when properly diluted, is utilized as phosphoric acid. It usually happens that this residue is colored from impurities, but can easily be rendered perfectly colorless by heating for a short time with nitric acid, being careful to expel all the excess of acid before diluting. As a practical point in the manufacture of phosphoric acid, Prof. Markoe has recommended to add to the mixture of phosphoric and nitric acids small quantities of *oxalic acid;* on coming in contact with hot nitric acid, oxalic acid splits up into carbonic acid and carbonic oxide. By this means we can get rid of all excess of nitric acid at a comparatively low temperature, and avoid the danger of converting a portion of the product into meta-phosphoric acid.

To successfully manufacture hydrobromic acid by this process is a matter of the greatest ease when one is familiar with it. The most that can be said against it, is that the addition of large quantities of bromine is tedious; this is obviated in a measure by using a stoppered glass globe in place of a funnel tube.

Prof. Markoe has lately modified the process as here given, and is at the present time conducting a series of experiments, to adapt it to the pharmacopœia. From remarks by Prof. Markoe I gather the following information: Bromine, although insoluble in water, readily dissolves in hydrobromic acid, in proportion as the acid is weaker or stronger; if we start with water, it will be necessary to first form a small quantity of hydrobromic acid by slowly dropping bromine upon phosphorus covered with a little water, after which we can convert any quantity of bromine into hydrobromic acid with great rapidity and perfect safety, no more apparatus being required than a glass flask.

There is, of course, a limit to the quantity of bromine that can be added, but only by the liquid becoming saturated with the gas. To determine this limit I placed two ounces of phosphorus and 500 *cc.* of water in a glass flask, then added drop by drop two or three grams of bromine, after which it was a matter of the greatest ease to introduce the remainder of the bromine, by pouring off the acid liquid and shaking with fresh portions of bromine after each addition. The quantities dissolved by the acid liquid showing a gradual increase, until finally I could add 150 grains of bromine at each time, the reaction proceeding quietly, with an increase of temperature. It required 732 grams of bromine to saturate the liquid, resulting in a highly corrosive and fuming acid.

By heating in a flask connected with a delivery tube, the excess of gas is driven off and absorbed by distilled water. The remaining acid is then transferred to a retort and can be distilled unchanged. Specific gravity 1.4832, containing about 48% of HBr.

Dr. Squibb has overcome the difficulty of distilling hydrobromic acid made from potassium bromide by sulphuric acid, by allowing the potassium sulphate to crystallize out. This is more readily accomplished if an excess of sulphuric acid is used. However carefully the distillation may be conducted, the product always contains noticeable quantities of sulphurous and sulphuric acids. In my opinion, the process is far more difficult and tedious than that of Prof. Markoe's, and certainly yields no better results.

If a large quantity of concentrated hydrobromic acid is to be distilled at one time, I have found it advantageous to use a small retort, arranging the bulk of acid in such a manner that it will flow into the retort only as fast as it distils over. In this way I have been able to distil from a quart retort two or three gallons of strong hydrobromic acid, with only the heat of a Bunsen's burner.

Indian Quinine.

IT is announced that Dr. King, in charge of the Government cinchona factory at British Sikkim, has succeeded in manufacturing, for the first time in India, sulphate of quinine from local cinchona bark. The samples produced are said to bear comparison on analysis with the pure sulphate of quinine of commerce, and preparations are being made for undertaking the manufacture on a large scale. According to the recent report of the Government quinologist for 1880-81, the factory at Darjeeling disposed of 8,600 lbs. of febrifuge during the year, and harvested a crop of 348,560 lbs. of bark. The earnings for the year amounted to 80,290 rupes, giving a dividend of 8 per cent on the capital of the plantation, exclusive of the saving to Government of 4½ lakhs of rupes, through the substitution of the febrifuge for quinine in the public hospitals.

At the Government cinchona factory in British Sikkim, a new product, which claims to be an improvement on the cinchona febrifuge, is a "crystalline febrifuge." The peculiarity of this preparation is that it consists of the mixed sulphates of the crystallizable alkaloid only. By rejecting those that are not crystallizable, it is expected that the nausea, which sometimes follows the taking of the febrifuge, will also be eliminated.

Oxalic Acid from Paraffin Oils.

J. GALLETLY and J. S. THOMPSON treated a paraffin oil, sp. gr. about 0.800, obtained by the destructive distillation of shale, with twice its volume of nitric acid, sp. gr. 1.3. The action is at first violent, but has to be completed with the aid of a gentle heat. After the reaction is finished, the liquid separates into three layers. The lower one, consisting of the excess of acid, on evaporation at a gentle heat, yielded a crop of yellow crystals, which, after recrystallization, were obtained in a colorless condition. They proved to be pure oxalic acid. The authors identified the body by its reactions and analysis of the acid, and its calcium salt.—*Chem. News*, Dec. 9th, 1881.

Chewing Gum.

FORTY thousand dollars' worth of chewing gum is gathered in the State of Maine every year. In Oxford County is a man who makes it his business to collect spruce gum. Every year he buys from seven to nine tons. The gum is found chiefly in the region about Umbagog Lake, and about the Rangely lakes. A number of men do nothing else in the winter season than collect gum. With snowshoes, ax, and a toboggan, on which the gum is packed, they spend days and nights in the woods. The clear, pure lumps of gum are sold in their native state, the best bringing one dollar per pound. Gum not immediately merchantable is refined by a peculiar process. Sieve-like boxes are covered with spruce boughs, on which is placed the gum. Steam is introduced underneath. The gum is melted, is strained by the boughs, and then passes into warm water, where it is kept from hardening until the packer takes it out, draws it into sticks, and wraps it in tissue-paper, when it is ready for market.

The gum meets with a ready sale. There is not a village, town, or city in Maine where it is not in demand. One dealer last year sold fourteen hundred dollars' worth. In the large mill cities, gum has a free sale. In Biddeford, Lewiston, Lawrence, and Lowell, the factory girls consume large quantities. It is said that, in the lumber camps, gum is used as a means of extending hospitality. After meal-time, the host fills his own black clay pipe, and hands it to his guest. Later, clear lumps of spruce gum are placed before the visitor, and he is asked to take a chew. Some of the Maine gum finds its way to this market, from which it is distributed to the various outlying factory villages, where, as stated before, it is in good demand. Spruce gum is adulterated, and those who practise this, take the trouble to fashion the pieces of gum to appear like those taken in a pure state from the trees. The ingredient of adulteration is supposed to be the gum of the pine tree.—*Providence Journal.*

[Original Communication.]

Sodium Ethylate or Caustic Alcohol.*

BY LINVILLE H. SMITH, PH.G.

Sodium ethylate, or caustic alcohol, as it has been called, was introduced as a therapeutical agent in the year 1870.

In that year, Dr. B. W. Richardson, of England, experimented with it and recommended it in cases where a strong caustic is required. Since its first introduction, it has been used by others, and in the accounts of its use, it is spoken of in the highest terms, for use in the cases to which it is suited. Sodium ethylate is formed by the decomposition of absolute alcohol with pure metallic sodium. The chemical formula of the compound is $C_2H_5.NaO$; or alcohol which has had an atom of its hydrogen replaced by one of sodium. The reaction which takes place between the two bodies is as follows: $(C_2H_5.HO)_2 + Na_2 = (C_2H_5.NaO)_2 + H_2$, the hydrogen escaping as a gas.

Ethylate of sodium has been of little interest to chemists except as a curiosity, and, indeed, is scarcely mentioned in any works on chemistry which have been accessible to me; in one or two cases where it is spoken of, the authors simply state the fact that it is formed by acting on absolute alcohol with sodium, and give the formula for the compound.

It was first mentioned by Liebig, in the year 1837. The action of this substance as a caustic is based on the following fact: that when sodium ethylate is brought in contact with water, it immediately splits up into caustic soda, and ordinary or ethylic alcohol.

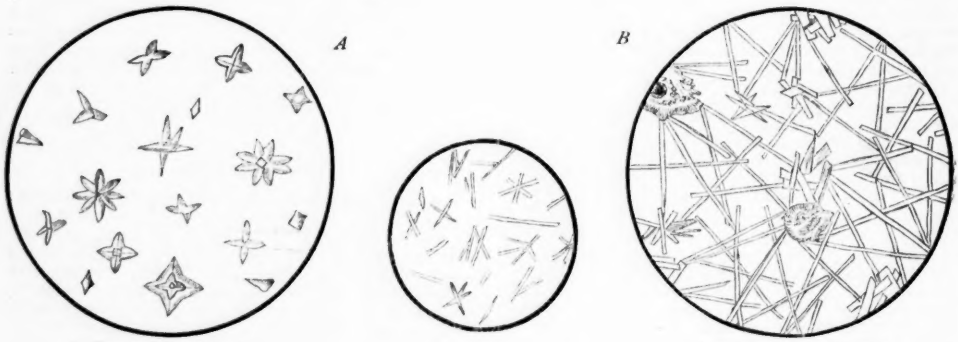
$$C_2H_5.NaO + H_2O = C_2H_5.HO + NaHO.$$

Therefore, when the compound is brought in contact with moist living tissue, the reaction will take place, and we not only have the caustic effect of the hydrate of sodium, but also the action of the alcohol which would tend to prevent hemorrhage, and also be of value on account of its antiseptic qualities. Dr. Richardson, and also Dr. Brunton, have used the compound in numerous cases for the removal of nævus, even where other agents had failed. The compound has not had any extended use, but I think, as its virtues come to be known, it will meet the requirements of a large number of cases where caustic effect is desired. It is used in solution, the solvent, of course, being absolute alcohol. It is recommended to be applied with a glass rod. The first thing requisite in making the compound is absolute alcohol. This, though not always to be obtained in the market, can be made in the laboratory without much difficulty.

On dropping sodium into alcohol, a brisk reaction commences, bubbles of hydrogen are given off, and considerable heat is developed. If the piece of sodium added is comparatively small, it is soon all dissolved, and we have a colorless solution of sodium ethylate. If the quantity of sodium is increased, and means are not taken to check the reaction by lowering the temperature, it will soon become so violent as to melt the sodium, and as the melted metal floats on the surface of the alcohol, more or less of that liquid is volatilized. On the other hand, if means are taken to keep the temperature down, the reaction becomes slower and slower as the solution of the ethylate becomes stronger. The action will commence again, however, as the temperature is raised sufficiently. The combining weight of sodium is 23, and of alcohol 46. It requires, therefore, 23 parts of sodium to combine with 46 parts of absolute alcohol, forming 68 parts of ethylate of sodium and 1 part of hydrogen.

Dr. Richardson gives the following directions for preparing a solution of the proper strength for use: "Take half a fluid ounce of absolute alcohol; place in a two-ounce test-tube, surrounded by a water-bath at 50° F. Add sodium, in small pieces, to the alcohol as long as gas is given off. Then raise the temperature of the bath to 100° F., and add more sodium as long as it continues to dissolve. Lastly, cool to 50°, and add half a fluid ounce more of absolute alcohol."

I prepared a solution by this method, using 10 *cc.* of alcohol instead of one-half ounce. The sodium was cut from a weighed piece. After adding the sodium as long as it dissolved at 50° F., I had used 0.4 grams of that metal. After raising the temperature of the bath to 100° F., 0.23 grams additional of the sodium was dissolved. The solution was cooled to 50° F., and diluted with 10 *cc.* of absolute alcohol. The result was a perfectly clear and colorless solution measuring about 20 *cc.* In this had been dissolved a total of 0.63 grams of sodium. The solution was preserved in a carefully stopped bottle, and protected from the light. After a few days, the color had changed to a straw color, which gradually grew darker as the age of the solution increased. The principal objections which I find to this process are, first: the unnecessary time required to prepare the compound; second: we have two exceedingly hygroscopic bodies, both the absolute alcohol and the ethylate, exposed for a considerable length of time to the air; and third: the varying strength of the product. In the first place, we are directed to add the sodium in small pieces as long as it is dissolved. In doing this, considerable time is required, for at a temperature of 50° F. the sodium will not dissolve very fast, and we must wait after each addition until the piece is dissolved before adding more. Then, after the temperature is raised to 100° F., we have to go through the same process again, and by the time the product is finished it will be found that a good deal of time and attention has been required. In regard to



A. From a Dilute Solution.

Crystals of Sodium Ethylate.

B. From a Strong Solution.

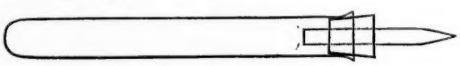
* Abstract of a thesis presented to the Massachusetts College of Pharmacy.

the second objection, we not only have the substances exposed for this length of time, but they are exposed under very unfavorable circumstances. It will be seen that as the bubbles of hot hydrogen are given off and come out of the alcohol, more or less vapors of that volatile substance will be carried with them. These vapors soon fill the test-tube, and as they come in contact with the air at the mouth of the tube, greedily absorb any moisture therein; and as the vapors condense on the sides of the test-tube, and run down into the alcohol, the moisture will be carried also. In the third place, the strength of the solution may vary from two reasons: First, it may have its strength decreased by a change of some of the ethylate to hydrate of sodium, as explained above, by the absorption of water. Second: there may be a difference of strength from the varying amount of sodium used. It would not seem, at first sight, that there would be any variation from this cause; but after going through the process several times, and noting the amount of sodium used, I found it to be different nearly every time. This difference is due, probably, to the following cause: Towards the last part of the process, the reaction becomes quite slow, but does not entirely stop; and as the operator watches the compound and sees how slowly the sodium is being dissolved, he, after waiting awhile, concludes that as much of the sodium has been dissolved as will be, and stops the reaction, which might have gone on slowly for an hour or more. And it is here that we find the cause, which is, in waiting a little longer in one case than another before considering the process completed.

To remedy these objections, I would propose, therefore, that the solution be made from a *weighed amount of sodium*, and that it be made as quickly and with as little exposure as possible. After preparing the compound several times, I found that the average weight of sodium used for making 20 *cc.* was 0.635; this would make 1.877 grams of sodium ethylate.

This amount dissolved in 20 *cc.* of alcohol would make a solution containing 9.385%. As this comes so near to 10%, I think it would be better if it were made of just that strength, and there could be no possible objection to the very slight increase in the strength of the solution to bring it up to 10%. To make the compound of this strength would require 0.68 grams of sodium to 20 *cc.* of absolute alcohol.

23 : 68 :: 68 : 2.01. 2.01 grams of the ethlate in 20 *cc.* would make the solution equal to 10.05%, or practically 10%. (2.01×5=10.05.)



I prepared the solution of this strength as follows: 20 *cc.* of absolute alcohol was placed in a test-tube, and the tube closed with a perforated cork, into which a small tube drawn to a fine point had been inserted. The test-tube was placed in a bath of ice-water. 0.68 grams of sodium was weighed out, cut into three equal pieces, and immediately replaced in the hydrocarbon oil, in which it is kept. Taking one of the pieces of sodium, it was quickly dried of the oil and dropped into the alcohol, and the cork replaced in the test-tube. The sodium was rapidly dissolved, and a second piece was added. As the solution became stronger and the reaction slower, the test-tube was removed from the bath from time to time, so as to allow the temperature to rise and hasten the solution of the sodium, care being taken not to allow the reaction to go on too fast; as soon as the second piece was dissolved, the third was added and dissolved in the same way. The finished solution was immediately transferred to small bottles and kept from the light. It was a perfectly colorless, mobile liquid. At the end of two weeks, no change of color had taken place. The change of color which takes place in some solutions is probably due to secondary reactions * which take place between the sodium ethylate and caustic soda, which solutions will contain unless very carefully prepared. This may come from water in the alcohol, or it may be due to using sodium which has not had all the adhering oxide carefully removed from its surface. To insure a good product, therefore, the sodium should be cut bright and clean beneath the surface of the oil in which it is kept, and on transferring it to the alcohol it should be dried as quickly as possible, so as not to allow any oxide to be formed. Made in this manner, and carefully preserved, the solution cannot help being good. As the strength of the solution is increased, it becomes crystalline. A 25% solution is liquid at the boiling point, but as it cools it becomes a solid mass of crystals. When the liquid begins to cool and the crystals first begin to make their appearance, they very much resemble the crystals which we get in a hot saturated solution of chlorate of potassium; they are exceedingly thin plates, and grow to be from one-sixteenth to one-eighth of an inch across. Their shape is square or diamond-shaped. I succeeded in obtaining two different kinds of crystals on microscopic slides. The first were obtained from a comparatively weak solution, and crystallized quite slowly; they were mostly star-shaped, and took some very beautiful shapes. The second lot was obtained from a stronger solution, and were needle-shaped, with some odd-shaped crystals and masses intermixed. I found considerable difficulty in getting good specimens for examination with the microscope, on account of the crystals being so deliquescent. They will not keep in good order more than a few hours, even when covered with a glass cover and perfectly protected from the air.

Sodium ethylate, in the solid form, I found even harder to keep than the solution. A bottle filled with it and carefully stopped and kept in a dark place, had a layer an eighth of an inch in thickness on its surface, changed to a deep-brown color in twenty-four hours. A small tube was filled full and hermetically sealed; this kept much better, but after a week a very slight change of color could be perceived. By evaporating a solution carefully, a white powder is obtained, which is the ethylate free from alcohol. I prepared some of the dry ethylate directly from sodium and alcohol. Of course, I had to use quite an excess of alcohol to allow for evaporation, for it required quite a high temperature to accomplish the purpose. Care was taken, however, not to use any more heat than was necessary. The compound formed was a compact white powder. It was left in the test-tube in which it was made, and exposed to the air for several weeks. A brownish stratum was formed on top of the powder, but the rest remained perfectly white. A little of the powder was placed in a test-tube, and some water added. The compound was dissolved with a hissing sound, and the tube was heated quite hot. Heated with fats, the ethylate forms soaps.

A 10% solution heated with an equal volume of olive oil forms a perfectly clear liquid of an amber color; on cooling, it solidifies to a whitish soap perfectly soluble in water. As would be expected, the ethylate is incompatible with nearly everything. If a few drops of solution of nitrate of silver be added, a precipitate of oxide of silver is formed. Hydrochloric acid produces a white precipitate of chloride of sodium; nitric acid a similar precipitate of nitrate of sodium. If a crystal of nitrate of potassium is placed in a test-tube containing the solution, and a few drops of sulphuric acid cautiously added and the mixture gently warmed, vapors of nitrous ether are given off. Tannic acid is turned an emerald-green color by the solution. Other reagents form more or less complex reactions in nearly every case, and the list could be continued almost indefinitely. Ethylate of potassium can be made in the same manner as ethylate of sodium, but it has not been used to any extent, being thought more liable to produce hemorrhage.

* If the alcohol is not redistilled from glass vessels, and kept in such, the product will also become darker-colored by age.—Ed. N. R.

Professor Robert Bridges, of the Philadelphia College of Pharmacy, died in his seventy-sixth year, on the 20th of February. We shall give a more extended obituary notice hereafter.

Does Cod-liver Oil contain 0.05 per cent of Iodine as stated in Garrod's Materia Medica?

PERHAPS I ought to mention that this question has appeared in the "blue-list" of the British Pharmaceutical Conference for some years past, and it was with the hope of being able to offer some remarks on the subject to that body that I commenced my experiments some time ago. Various circumstances, however, prevented me from making sufficient advance in time.

Whether iodine is present at all, whether it is occasionally present, or whether it is a constant constituent in considerably quantity, appears to have been a subject of dispute from the time when cod-liver oil first attracted particular attention as a remedial agent.

One section* of observers had it that iodine is found in all true cod-liver oil; another,† that it is not a constant constituent; a third‡ has failed to find it at all.

The principal method made use of by these authorities, consisted of saponification, carbonization, and the extraction of any iodide present in the carbonized residue by exhaustion with alcohol. It was found by them that the iodine could not be detected by saponification and decomposition of the resulting soap by acids, nor by the immediate carbonization of the oil.

I need not trouble you with the details of my preliminary operations. The principal method I made use of, then, consisted of saponifying the oil with alcoholic solution of potash, carbonizing the resulting soap, exhausting the residue, acidifying the resulting solution with hydrochloric acid, and precipitating the iodine as palladium iodide. In this manner I estimated samples of oil to which known quantities of iodide of potassium had been added, and then attempted to obtain an appreciable amount of palladium iodide from various quantities of different sample of cod-liver oil, but without success.

One of the principal difficulties I had at this part of the proceedings was with the hydrochloric acid, samples supposed to be pure setting free either partially or entirely the small quantity of iodine present.

Having failed to obtain any satisfactory results with palladium chloride as a precipitant, I determined to endeavor to estimate any iodine present in my samples of oil, as iodide of starch, by color comparison with solutions containing known quantities of that substance. In order to test the value of this method, I made the following solutions:

Solution A. measured 5,000 grain measures, and contained iodide of potassium in the proportion of 1 part in 10,000 of water.

Solution B. measured 5,000 grain measures, and contained (besides iodide of potassium in the same proportion as A.) carbonate of potassium, free from iodine, similar in quantity to what would result from the carbonized residue of 5,000 grains of cod-liver oil which had been saponified with caustic potash.

Solution C. This solution was prepared by dissolving 1,250 grains of carbonate of potassium, free from iodine, in distilled water, and adding 0.5 gr. of iodide of potassium.

To solution A. I added a few drops of solution of nitrite of potassium, starch liquor in excess, and dilute sulphuric acid.

To solution B. I added dilute sulphuric acid until the solution was slightly acid, and set aside for two or three hours, filtered, and washed the deposited sulphate of potassium upon the filter with a small quantity of distilled water; to the filtrate, solution of nitrite of potassium and starch liquor were then added.

C. Evaporated this solution to dryness, carefully removed the residue from the evaporating dish, and rubbed it into a thin paste with rectified spirit; returned the mixture to the evaporating dish, and boiled with successive portions of rectified spirit; filtered the solution, and washed the residue on the filter with spirit; added water to the filtrate, and evaporated to dryness; dissolved the residue in water; filtered; washed the filter well with water, and to the filtrate added solution of nitrite of potassium, starch liquor, and dilute sulphuric acid.

These solutions (A., B., and C.) were then diluted until, when stood upon a sheet of white paper, their depth of color could be easily compared, either in the white stoppered bottles in which I had placed them, or in Nesslerizing tubes; they were equal in depth of color.

Solution D. measured 5,000 grains, and contained iodide of potassium in the proportion of 1 part in 100,000 of water.

E. contained the same proportion of iodide of potassium as solution D., and carbonate of potassium free from iodine, similar in quantity to what would be found in the carbonized residue from 5,000 grains of cod-liver oil which had been saponified with caustic potash.

F. contained iodide of potassium in the proportion of 1 part in 1,000,000 of water.

G. contained iodide of potassium in the same proportion as F., with addition of carbonate of potassium, as in the previous cases.

To solutions D. and F. the starch test was applied at once; solutions E. and G. were treated by acidification, separation of sulphate of potassium, and application of the test for iodine, as before.

Solutions D. and E., containing 1 part of iodide of potassium in 100,000, were made up to an equal bulk and compared; the depth of color of the two solutions was equal; the color of solution D., however, approached nearer to violet than solution E.

Only a very faint reddish tint was developed in solutions F. and G., containing 1 part of iodide in 1,000,000.

From the foregoing experiments, I inferred that the quantity of alkaline sulphate remaining in solution after acidulation with sulphuric acid and separation, in the manner described, was not sufficient to interfere to any appreciable extent with the color developed, and that exhaustion with rectified spirit and estimation of the iodine from the spirituous extract has no advantage over this method.

I now proceeded to estimate the iodine in the following six samples of cod-liver oil. In each case 5,000 grains of oil were taken and saponified with alcoholic solution of potash, containing as much caustic alkali as would theoretically be required to saponify that quantity of cod-liver oil, reckoned for the purposes of these experiments as 95 per cent oleine, by stirring together and heating over a water-bath for six hours, removing the whole arrangement from the fire, and setting aside until a solid mass of soap had formed. I then projected this mass, a portion at a time, into a large crucible placed in a stove. When the mass had been sufficiently burnt, the crucible was removed from the fire and allowed to cool; the residue was then lixiviated with water, the undissolved portion thrown upon a filter, and washed until the washings ceased to be alkaline to test-paper. This filtrate was then concentrated considerably by evaporation. When quite cold, it was slightly acidulated with dilute sulphuric acid, and set aside for two or three hours, filtered, the sulphate of potassium washed upon the filter, and the precipitate allowed to drain. To the filtrate a few drops of solution of nitrite of potassium and an excess of starch-liquor were then added, and if necessary more dilute sulphuric acid.

Solutions containing known quantities of iodide of potassium were prepared and compared with the solution obtained from the cod-liver oil residue, both being diluted equally, and to such bulk as would allow of easy comparison. After the solution had been compared a first time, they were set aside in stoppered bottles until the iodide of starch had completely subsided, when more starch solution was added, and the solutions again compared.

The dilute acid used contained 1 part of pure strong acid in 8 parts.

The starch was made in the usual way, 1 part of starch

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* De Jongh, Garrod, and others.
† Bentley and Redwood, Chevallier and Gobley, Herberger, and others.
‡ Ure, Marder, and Kümmel.

to about 150 parts of water—the perfectly clear liquor alone being used.

For the solutions containing known quantities of iodide of potassium, a solution of iodide of potassium was prepared containing 1 part of pure iodide, dried at 180°, in 1,000, and the quantities measured from this by means of a pipette graduated in grain measures.

The following six samples of cod-liver oil were purchased from first-class houses in London, but beyond speaking positively as to their place of preparation, they could give me but little information concerning them.

Sample No. I. was a pale oil, prepared in Norway, very little sensitive to cold, and having—for cod-liver oil—quite a pleasant flavor. The amount of iodine calculated as KI yielded by it was 0.105 gr., or 0.21 part in 10,000.

No. II.—This was a pale Norwegian oil of ordinary quality, having a flavor not quite so delicate as the preceding and more sensitive to cold. The iodine calculated as KI yielded by it was 0.09 gr., or 0.18 part in 10,000.

No. III. was a light-brown Norwegian oil, with a more decided and less pleasant flavor than the preceding. It yielded 0.08 gr. of iodine, calculated as iodide of potassium, or 0.16 part in 10,000.

No. IV. was a sample of a light-brown, much puffed oil, said to have been prepared in Norway. It yielded 0.08 gr. of iodine, calculated as KI, or 0.16 part in 10,000.

No. V.—This was a pale oil, prepared in Newfoundland, very free from smell and flavor, but very sensitive to cold. It yielded 0.06 gr. of iodine calculated as KI, or 0.12 part in 10,000.

No. VI. was a Newfoundland oil of a light-brown color and strong flavor. It yielded 0.07 gr. of iodine calculated as KI, or 0.14 part in 10,000.

From the foregoing experiments it seems probable that iodine is a constant constituent of cod-liver oil, but that it is not present in quantity at all approaching 0.05 per cent, as has been stated.

It will be observed that the amount of iodine yielded by these oils was in inverse proportion to their sensitiveness to cold.*—By M. MITCHELL BIRD, F.C.S., read at an evening meeting of the Pharmaceutical Society, February 1st, 1882.—Published in *Pharm. Journ.*, February 4th.

Compound Solution of the Hypophosphites of Iron Soda, Lime, and Magnesia.†

WITHIN the last two or three years, the hypophosphites have been gaining favor with medical men, and are gradually replacing the phosphates in the treatment of those cases where it is desired to introduce phosphorus into the system, either alone or in combination with iron and other bases. This is not surprising if we take into account the fact that phosphorus is held more loosely in the hypophosphites than in the phosphates, and that it might accordingly be expected that its assimilation by the various tissues requiring it would be much more readily effected from the former than from the latter.

The extreme solubility of the hypophosphites is another important point in their favor; all the alkaline and earthy salts of hypophosphorous acid being readily soluble in water, while the corresponding salts of phosphoric acid are nearly all insoluble in that menstruum, requiring the addition of a strong acid to effect solution. In fact, doubts have been expressed as to whether the phosphates are assimilated in the system at all, or whether the benefit derived from their use does not depend upon the action of the bases alone.

For many years a preparation of hypophosphites has been before the profession, and latterly another preparation has been introduced from the other side of the Atlantic, but neither of these gives the proportionate amount of hypophosphites in solution, consequently prescribers are working in the dark, while both are very expensive preparations, and, therefore, not suitable for general use.

A much more satisfactory preparation than these is that recommended by Dr. Frederick Churchill, of the Victoria Hospital for Children, London. The formula of this preparation he published in an article communicated to the *British Medical Journal* for March 27th, 1880.

Having been desired to make a quantity of this preparation and seeing the interest taken in the administration of hypophosphites at the present time, I have thought that the subject would not be an unsuitable one to bring before you for discussion.

It will be observed that the bases entering into the formula, which I shall now give you, are similar to those of Parrish's syrup, with the exception of the magnesium salt, the author of the formula substituting this for the potassium salt, owing to some objections which attend the administration of the latter:

	Grains in 100 minims.	Grs. in fl. ʒ i.
Ferrous hypophosphite, ($FeOPH_2O_2+6H_2O$).....	2.77	1.6
Calcium hypophosphite, ($Ca_2PH_2O_2$)	3.5	2.
Sodium hypophosphite, ($NaPH_2O_2+H_2O$)	3.5	2.
Magnesium hypophosphite, ($MgPH_2O_2+6H_2O$)	1.99	1.1
Hypophosphorous acid (H_3PO_2).	1.66	
Water.....	.86.58	
	100.00	6.7 grs. mixed salts.

It will be observed that the formulæ for the ferrous, calcium and magnesium hypophosphites are incorrectly stated, the correct formulæ for the salts being—

$Fe(PH_2O_2)_2+6H_2O$
$Ca(PH_2O_2)_2$
$Mg(PH_2O_2)_2+6H_2O$.

This of course involves a great difference in the amount of hypophosphorous acid present in these salts, which in the case of the ferrous and magnesium salts is understated to the extent of one-half, and in the calcium salt to the extent of three-fourths.

With the view of securing the iron in a ferrous condition, double decomposition with ferrous sulphate and calcium hypophosphite was had recourse to (in preference to the uncertain method of saturating the hydrate, or the slow process of dissolving metallic iron in hypophosphorous acid), and having assured myself that this could be accomplished, the sodium and magnesium hypophosphites were made in the same way.

The only drawback to the preparation of the various hypophosphites from calcium hypophosphite and the corresponding sulphates, is the formation of sulphuretted hydrogen in the solution, after it has stood for a little time. This result you may imagine would give considerable annoyance were its formation not obviated by the adoption of a proper method to insure double decomposition between the sulphates and calcium hypophosphite, without the possibility of any by-products, so to speak.

The sulphuretted hydrogen may arise in the following manner. It is well known that hypophosphorous acid acts as a powerful reducing agent, so that when brought into the presence of sulphuric acid (either pure or as sulphate) the sulphuric would be reduced to sulphurous and the hypophosphorous raised to phosphorous acid thus,

$$HPH_2O_2+H_2SO_4=H_3PO_3+H_2SO_3.$$

Sulphurous acid again acting upon a fresh molecule of hypophosphorous acid would raise it to phosphorous acid with liberation of sulphur, thus,

$$2HPH_2O_2+H_2SO_3=2H_3PO_3+S+H_2O.$$

* The author's results show such a difference in quantity of iodine from that reported by former authorities, that a doubt may arise respecting the correctness of *all* statements on this point so far made. A positive proof, that a larger quantity of iodine has been found in the oil than Mr. Bird has met with, would naturally outweigh the statements of the latter. One point appears to us to have been paid no attention to, namely: is it positively proven that no iodine or iodide is lost by vaporization during the incineration of the mass?—ED. NEW REM.

† By Adam Gibson, from the *Pharm. Jour. and Trans.*, of Jan. 21st.

But this sulphur would not be found as such, for, being in the presence of a reducing agent of so great power as hyposulphurous acid, the following action will in all likelihood ensue:

$$HPH_2O_2 + S + H_2O = H_3PO_3 + H_2S.$$

At all events, it is certain that sulphuretted hydrogen is formed in the solution under certain conditions, and I merely suggest these reactions as those which may probably take place.

In order to obviate these objectionable reactions, I have adopted the plan of dissolving all the salts in hot water, since, if decomposition takes place in the cold, it is prolonged, and may give rise to the above reactions; whereas, by the employment of hot water, the change ensues immediately, and thus contact between the acids is avoided.

It will be observed in the undernoted formula that the hypophosphorous acid is stated as containing thirty per cent HPH_2O_2. This has been found to be about the usual strength of the commercial acid.* The acid also usually contains traces of sulphuric acid, which slightly interferes with the finished product, by precipitating a little lime as sulphate from the calcium hypophosphite, added at the end of the process.

The working formula is as follows:

		Avoird.
1.	*Sulphate of iron* ($FeSO_4.7H_2O$)	2 oz. 382 grains.
	Hypophosphite of calcium ($Ca\,PH_2O_2)_2$)	1 oz. 332 "
2.	*Sulphate of sodium* ($Na_2SO_4.10H_2O$)	5 oz. 364 "
	Hypophosphite of calcium	3 oz. 35 "
3.	*Sulphate of magnesium* ($MgSO_4.7H_2O$)	2 oz. 22 "
	Hypophosphite of calcium	1 oz. 182 "
4.	*Hypophosphite of calcium*	3 oz. 368 "
5.	*Hypophosphorous acid* ($HPH_2O_2.70H_2O$)	5½ fl. oz.

[NOTE.—1, yield 2.77 oz. of ferrous hypophosphite. 2, yield 3.5 oz. of the sodium salt. 3, yield 1.99 oz. of the magnesium salt. 5, represents 1.66 oz. of the pure acid.]

Dissolve the whole of the calcium hypophosphite required to decompose the sulphates (6 ounces 112 grains) in 50 fl. oz. of water, bring the solution nearly to the boiling point, and acidify with half an ounce of hypophosphorous acid; then stir in the ferrous, sodium, and magnesium sulphates; double decomposition ensues almost immediately. After stirring two or three minutes, throw the whole upon a paper filter, and wash the precipitate with hot water to 70 fl. oz.

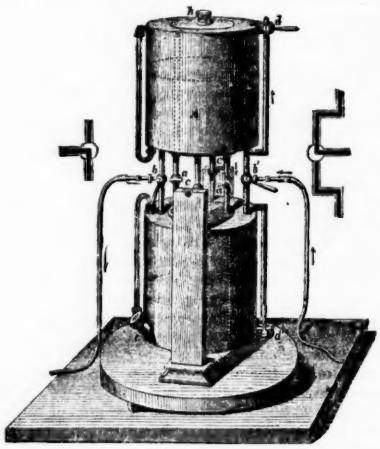
Dissolve the 3 oz. 368 grains of calcium hypophosphite in 25 fl. oz. of water; filter, mix the filtrates, add to the solution the remainining 5 oz. of hypophosphorous acid, and make up with water to 100 fl. oz.

During a few days after its preparation, it deposits a minute quantity of calcium sulphate, from which, however, it may be wholly freed by decantation or filtration.

This forms a clear and permanent solution; it may be mixed with simple syrup, claret, and glycerin in any proportions, but the salts are gradually deposited from mixtures containing an appreciable percentage of alcohol.

Reversible Gasometer and Aspirator.

AMONG the forms of apparatus which may be used for the purpose of aspirating or of delivering a stream of compressed air, the reversible gasometer occupies a prominent place. Such an apparatus is here illustrated. It consists of two hollow drums, *A A'*, made of sheet-copper, each of them provided with a water-gauge, and connected with each other by the tubes *a a'*, *b b'* in the following manner: *a'* extends from the bottom of one drum nearly to that of the other, *a* from the bottom of one to the top of the other. Both are provided with plain one-way stop-cocks; *b* and *b'* connect the two tops of the drums, and carry in their centre each a two-way stop-cock, the construction and function of which may be seen from the diagrams on either side of the main figure. From the tube *b'* proceed two tubes, bent at right angles to the stop-cocks *d* and *d'*, by means of which communication may be established with the bottoms of the upper or the lower drum. From the stop-cocks *b* and *b'* extend, horizontally, two strong hollow axes, by means of which the apparatus may be swung in the frame. [As will be seen, by examining the cut, the apparatus is represented as having been unswung and turned half way round in order to present a clearer view of the different parts]. These axes are connected, by means of nipples, with flexible tubes. For use, the upper drum is filled with water, through *h*, all other stop-cocks being shut off. After *h* has been again closed, the stop-cocks are brought in the position shown in the cut, whereby the water from the upper drum flows in the lower, thereby expelling the air therein through *b*, and aspirating air through *b'*, *d*. As soon as all the water has run in the lower drum, *a'* and *d* and *b* and *b'* are shut off. This severs all connection between the drums. The apparatus is then turned over, and the stop-cocks opened in the succession *b*, *a'*, *d'*, and *b'*, when it will operate again in the manner just described.*



Yellow Saltpetre.

THE "yellow saltpetre," usually called *caliche azufrado*, is found in the nitre-beds of Atacama and Tarapaca (now belonging to Chili). It has a sulphur-yellow to reddish-yellow color, and, according to Domeyko, has the following composition:

Sodium chromate	0.90
" iodate	4.95
" nitrate	42.80
Potassium nitrate	12.81
" sulphate	4.59
Sodium chloride	16.63
Lithium chloride	0.12
Other substances	19.20
	100.00

* The percentage was thus determined: A known quantity of freshly calcined lead oxide was mixed with a known quantity of the commercial acid. To this a little nitric acid was added, and the whole evaporated and calcined. The weight of the product, after deducting the amount of PbO, gave the amount of acid present as P_2O_5, from which the amount of HPH_2O_2 was calculated.

* After *Arendt* (*Dr. Rud.*), Technik d. *Experimentalchemie*, I., 34.

Quillaiine; Its Mode of Preparation, Uses, and Advantages.*

"QUILLAIINE," vel EXTRACTUM QUILLAIÆ EXSICCATUM. I am aware that the latter term would more clearly express what I am about to describe. I am of the opinion that the substance itself will come into very general use, and, therefore, a short and expressive name is most desirable. Emulsin is already appropriated; and saponin is altogether a very different thing, although the quillaiine (so-called) is in part very largely composed of saponin.

The quillaiine is a substance that should be of interest to every pharmacist, and I am sure needs but to be known to be appreciated. Quillaia bark is well known among druggists, and is as generally steered shy of, on account of its sternutatory action, but, nevertheless, we shall endeavor to become better acquainted with it before long. Before shaking hands with it, as it were, pledgets of cotton moistened and inserted into each nostril, will be found to be of decided advantage. Then boldly take any quantity of the bark, and after breaking it into pieces of a suitable size, place in an iron mortar, and bruise it—after which it may be transferred to the mill, and ground—not too fine; then place it in a glazed dish, cover it with water, boil, and strain (or percolate); repeat once or twice more; mix the decoctions, and filter; then evaporate (towards the last using a water-bath) to dryness. The yield will be from 20 to 25 per cent; resulting in a brownish-colored substance of a sweetish taste, and an after-taste more or less acrid. Being exceedingly friable, it may be powdered and sifted with very little trouble—not forgetting to *cotton* your nose; but I prefer, when it is evaporated to a syrupy consistence, to spread it on plates of glass, and let it dry, when it may be removed in scales, more or less brilliant, in which case, should it ever arise to the importance which I think its convenience merits, this method would guard against adulteration, etc. By treating with animal charcoal, it may be obtained devoid of color, but I do not deem it at all necessary, the result obtained as it is producing the whitest kind of an emulsion. Neither the powdered *quillaiine* nor the scales manifest any hygroscopic action, and will, therefore, keep indefinitely well. I made a long series of experiments, with a view to deprive it of the after-taste (without impairing its virtue), but the result has not been as satisfactory as I could have hoped for. However, on experimenting with it to ascertain its *strength*, we are surprised at the exceedingly small amount necessary to produce the effect desired. Let us take half a grain, or one of these *one-grain* powders of it, and dissolve it in half an ounce of water (you see it dissolve very quickly; now we shall add to it an ounce of any *fixed oil*. This oil I am about to use is cod-liver oil. You see, just a few shakes, and it is completely emulsified, forming a perfectly homogeneous mixture. This, on standing for two or three days, may show a partial separation of the water, forming at the bottom (not clear), while the oil remains permanently white; but a gentle shake or two will unite them again as intimately as at first. If, however, we use nine ounces (90 per cent) of oil to one ounce of water, holding, say, nine grains of quillaiine in solution—ONE GRAIN TO EACH OUNCE OF OIL USED—apparently no separation will take place, and the emulsion will become much thicker; but that is just the trouble with all emulsions at present emanating from the mortar and pestle. The thickening acquired in making them prevents, by sticking to the tongue and mouth, their being easily swallowed. Now, in the case of castor oil, it is quite thick to start in with; but let us dissolve two grains of the quillaiine in two ounces of water; now add to it two ounces of castor oil, and give a few shakes—how quickly this is done! Now look at it; you see it is quite thin and very white, and apparently as simple as its great prototype—milk; and, I am sure, may be as readily swallowed.

The following may be cited as useful instances of its application.

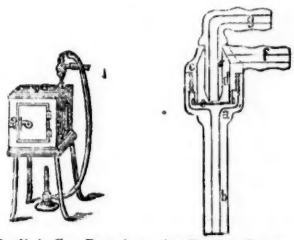
℞ "Quillaiine" ..... gr. iv.
Aquæ ..... ʒi.
Olei morrhuæ ..... iv.
Syrupi hypophosphitum (calcii, sodii, etc.) .. ʒ iij.
Olei aurantii ..... gtt. v.
Misce.

℞ "Quillaiine" ..... gr. iij.
Aquæ cinnamomi ..... ʒ iiss.
Olei ricini ..... ʒ iij.
Glycerini (vel syrupi) ..... ʒ ss.
Misce.

℞ "Quillaiine" ..... gr. i.
Aquæ gaultheriæ ..... 3 vij.
Oleoresinæ filicis ..... 3 i.
Misce.

At first sight, these examples of prescriptions appear to be upside down, but I have written them in the order in which the ingredients should be mixed. I call attention to the last one, and it is, in my opinion, the most eligible way to dispense the *male fern* mixture. In this way (the sugar being intentionally left out), it makes a smooth, nice-looking mixture, the last drop of which may be drawn from the bottle, and can be readily swallowed; and all of you know how abominably some physicians direct us to prepare that dose.

When my attention was first settled upon this substance, I set myself the task to counteract the acrid after-taste, not realizing how little of it is present in the very small quantity necessary for our purpose; and I am safe to assert, so trifling is it that it may be entirely overlooked.



Seelig's Gas Regulator for Drying Ovens.

Gentlemen, try it; I can recommend it to you on the score of economy, its great saving of time, its handsome results, appearance, and general effects, facts that should make it popular to the druggist, pleasing to the physician, and grateful to the patient.

NOTE.—If no sugar be added to the emulsion containing quillaiine, it will not ferment; at least I have some on hand that is fully a year old, made directly from the decoction, and is still good.

* By S. A MCDONNELL, Ph.G. Read at a meeting of the California College of Pharmacy, Jan. 12th, 1882, and published in the *Proceedings of the California Pharm. Society and College of Pharm.* 8vo. San Francisco, 1882, p. 29.

Gas Regulator for Drying Ovens.

TO prevent the complete evaporation of water from double-walled drying ovens, Mr. Eduard Seelig has devised the following piece of apparatus. An attachment made of brass, and illustrated in Fig. 1, is inserted, by means of a well-fitting cork, into the neck of the water-bath (see Fig. 2). The internal construction of the attachment will be seen in the cut. The gas required for the burner is conducted through a tube connected with *f*, whence it passes into the space *d* and from there enters the lower orifice of *g*, which is connected with the burner by a flexible tube. As soon as the heat has raised the temperature of the water so that considerable pressure is produced, the rubber disk at *e* begins to bulge upwards, thereby diminishing the space through which the gas passes, or, if the pressure increases, entirely prevents the passage of gas. To prevent the flame of the burner from going out entirely, a small hole is bored in the inner conus of *g*, which permits just enough gas to pass to keep a minute flame burning. As soon as the

pressure diminishes, the rubber disk loses its bulging shape and gas can pass again as before. By means of this simple apparatus the loss of water is entirely prevented, and the drying oven may be left to take care of itself. (To be had of Eduard Seelig, of Heilbronn, Germ.)

Emulsion of Cod-Liver Oil with Hypophosphites of Lime and Soda.*

I HAVE here a few specimens an emulsion of cod-liver oil with the hypophosphites of lime and soda, the latter being in the proportion of five grains to the tablespoonful. The emulsions contain respectively seventy-five and eighty per cent of cod-liver oil.

This is emulsified by means of Quillaia bark, digested in mixture of water with a portion of alcohol. The following is the formula which I have adopted for the preparation containing seventy-five per cent of the oil.

Four ounces of Quillaia bark in small pieces is digested in a mixture consisting of 24 oz. of water and 8 oz. of alcohol for eight days, being occasionally well shaken. At the end of this time, the liquid is filtered and set aside.

When I intend to use a portion for making an emulsion, I previously evaporate off the alcohol by means of a water-bath; two ounces of this is mixed with the same amount of glycerin; in this the hypophosphites of lime and soda are dissolved. The mixture is then transferred to a suitable vessel, when it is beaten into a creamy state by means of an egg-beater. Twelve ounces of best light-colored cod-liver oil is next added in small portions at a time, being properly emulsified after each addition, and flavored with essential oil almonds.

Made in this manner, it affords a very nice preparation, disguising the odor and taste of the oil, and mixing in all proportions with water without the separation of any oil globules. It is as permanent as any of the preparations in the market. After the lapse of a few days, a separation will perhaps take place. A little agitation causes it to resume its former condition. The glycerin is added to make it more palatable, and in no manner lessens the efficacy of the preparation, as it is sometimes used for the same purposes for which the oil is utilized. The emulsion requires a wide-mouthed bottle, and if it is too thick, this may be overcome by the addition of a small quantity of water.

This emulsion is very easily made, and I think will answer in all cases for those which are of late being so extensively advertised and praised—by the parties who make them—for the nicety of the preparation, and the large amount of oil emulsified.

Reactions of Thymol.

BY HAMMERSTEN AND ROLBERT.

THYMOL gives no reaction with ferric chloride. With hypochlorite of sodium and aniline it develops a blue color like phenol; but with hypochlorite of sodium and ammonia is produced, not a blue, but a green color which changes after a time to bluish-green, and after four to five days to red. This reaction is still visible in a dilution of 1 to 3,000. With Millon's reagent, a pale violet-red color is produced, which disappears on boiling; with phenol the color remains. With bromine water, thymol yields no precipitate, but only a milky opalescence. Hence, if it is desired to look for phenol in thymol, ferric chloride and bromine water would be the most reliable tests. The most delicate reagent for thymol is glacial acetic acid and concentrated sulphuric acid. For this purpose, the liquid to be tested for thymol is mixed with one-half volume of glacial acetic acid, then an equal volume of concentrated sulphuric acid is added, and the whole warmed, when a magnificent violet-red color will appear, which is still visible in a dilution of one to one million, and which is neither destroyed by an excess of the acid, nor by boiling.—*Upsala Läk.-f.-förh.* in *Pharm. Zeit.*

* By FREDERICK FRAZER, Ph.G., from the *Proceedings of the California Pharm. Society and College of Pharmacy*, 8vo. San Francisco, 1882. p. 31.

Selections from the Non-officinal Formulary of the Dutch Society for the Advancement of Pharmacy.*

(Continued from page 74.)

Infusum Cinchonæ Rubræ. Infusion of Red Cinchona.

	Parts.
Red cinchona, containing at least 6 per cent of alkaloids, in fine powder	15
Normal hydrochloric acid (see below)	5
Water	55
To make	200

Macerate the cinchona with the acid and a little water for several hours, occasionally stirring, until the froth has disappeared. Pour the mixture into a percolator closed with a linen pellet at the bottom. As soon as the liquid begins to run clear, pour water on top until 200 parts of filtered liquid are obtained.

The infusion is clear, of a reddish-yellow color, and should yield a copious precipitate both with solution of soda and with strong hydrochloric acid. (De Vrij.)

Magnesii Metatartras. Metatartrate of Magnesium.

	Parts.
Metatartaric acid (see next)	10
Distilled water	40
Magnesium carbonate, about	7
Alcohol	q. s.

Dissolve the acid in the water, and add, under stirring, so much carbonate of magnesium as may be required to be in slight excess. Filter the solution immediately, and add to the filtrate double its volume of alcohol. When the precipitate has settled, pour off the alcohol, spread the magma upon a plate of glass or porcelain, and let it dry in a cool place.

Metatartrate of magnesium is an amorphous, not hygroscopic salt, which may easily be converted into a white powder and is soluble in four parts of water. When dissolved in water it soon is converted into ordinary tartrate of magnesium, and, therefore, it should not be kept in stock in solution.

Acidum Metatartaricum. Metatartaric Acid.

Tartaric acid, in powder.....q. s.

Heat it in a porcelain capsule, upon a sand-bath, to 180° C. (356° F.); pour the melted mass, by means of a warmed glass-rod, in drops, upon a glazed plate, and transfer the pieces immediately, when cold, in a well-closed bottle.

Metatartaric acid appears in form of transparent, yellowish pieces, having an agreeable acidulous taste, and being hygroscopic.

When dissolved in water, the acid is soon converted into normal tartaric acid, particularly if the solution be warmed.

Mistura Anticatarrhalis (Hufeland's). (Hufeland's) Catarrh Mixture.

	Parts.
Extract of Carduus benedictus	3
" of Dulcamara	1
Fennel water	24
Cherry-laurel water	3

Mix them.

N. B.—Extract of Carduus benedictus and extract of Dulcamara are prepared thus: pour as much boiling water upon the finely-cut plants (dry or fresh) as is required to make a pulp, set aside for twenty-four hours, occasionally stirring, then express. Again pour on a somewhat smaller quantity of boiling water, let stand twelve hours and express. Evaporate the united liquids to a thick extract.

Cherry-laurel water (*Pharm. Neerlandica*) is prepared by distilling six parts of cherry-laurel leaves with enough water to obtain *at first* five parts, a portion of which is to be assayed for the amount of hydrocyanic acid present, after which the remainder is to be diluted with distilled water, so that 1,000 parts of the finished preparation may contain 0.839 parts of hydrocyanic acid, or so that one part of hydrocyanic acid is contained in 1,191 parts of the liquid.

* See original title in our January number, page 10.

Mistura anticholerica (Bleeker's). Bleeker's Mixture.

	Parts.
Aromatic wine of opium	2
Oil of peppermint	1
Spirit of ether	4
Water	750

Mix them.

N. B.—Vinum opii aromaticum corresponds to the Vinum opii of the U. S. Ph.

Spirit of ether is the continental modern form of Hoffmann's anodyne, prepared by mixing equal parts (by weight) of ether and alcohol (*Pharm. Neerlandica* and *Codex*) or one of ether and three of alcohol (*Pharm. Germ.*), etc.

Mistura balsamica (Choppart's).

(Choppart's) Balsamic Mixture.

	Parts.
Spirit of nitrous ether	1
Balsam of copaiva	8
Alcohol (stronger)	8
Spear-mint water	8
Orange-flower water	8
Syrup of orange peel	8

Mix them.

The original prescribes aqua menthæ crispæ, for which spear-mint water is the nearest substitute.

Oleum Betulæ rectificatum. Oleum Rusci.

Rectified Oil of Birch. Oil of Birch Tar.

Oil of birch tar is a red-brown, volatile oil, of a specific gravity of 0.800–0.987, soluble in an equal weight of alcohol, and imparting an acid reaction to water, after being shaken with it. It has the odor of so-called Russia leather, which, in fact, owes its peculiar odor to it.

Oleum Cadinum. Oil of Cade.

Oil of cade is a brownish or dark-brown, clear, viscid oil, obtained by the dry distillation of the wood of Juniperus Oxycedrus L.

The oil has a peculiar tarry odor, and an empyreumatic, bitter taste. It is readily imflammable and has an acid reaction. It is insoluble in water, but soluble in ether, chloroform, bisulphide of carbon, and amylic alcohol.

Oleum Morrhuæ iodoferratum.

Cod-liver Oil with Iodide of Iron.

[Oleum jecoris aselli cum iodeto ferrico.]

	Parts.
Iodine, in powder	5
Iron, in powder	10

Pour the cod-liver oil into a dry flask, which must be completely filled thereby, close it well, and dissolve in it the iodine, frequently shaking. After the solution has stood at rest for some time, and has acquired a spec. grav. of 0.932 to 0.937, add the iron, and shake the mixture, until it has assumed a purple-violet color and no longer imparts a blue tint to a dilute solution of iodide of potassium with gelatinized starch. Agitate the mixture occasionally, during twenty-four hours, then repeat the reaction for free iodine, and, if this appears to be absent, let the oil become clear by standing and transfer it to small amber-colored vials, which must be completely filled and well stoppered.

The product has a purple-violet color, a spec. grav. of 0.937 to 0.940, and contains about 1.23 per cent of iodine and 0.27 per cent of iron.

By shaking with a solution of starch containing some iodide of potassium, the oil should be readily converted into a bright-yellow liquid, free from blue tint or color.

Twenty grams of the oil, incinerated in a porcelain or platinum crucible, should leave 0.077 *gm.* of ferric oxide.

If 5 *gm.* of the oil be saponified with an alcoholic solution of caustic potassa, the soap incinerated, and the residuary carbonaceous matter extracted with water, the aqueous solution, strongly acidulated with hydrochloric acid, should yield, with palladium chloride, a precipitate which, when washed and dried, weighs about 0.087 *gm.*

[On the estimation of iodine in cod-liver oil compare this number, page 106.]

Oleum Morrhuæ Ferratum. Ferrated Cod-liver Oil.

	Parts.
Benzoate of iron (ferric) (see next)	1
Cod-liver oil	100

Dissolve the benzoate of iron, with the aid of a gentle heat, and by frequent agitation, in the oil.

The solution is a reddish-brown, clear liquid.

Ferri Benzoas. Benzoate of Iron.

	Parts.
Benzoic acid	10
Water of ammonia	14
Solution of chloride of iron (ferric) spec. grav. 1.480	11
Distilled water	q. s.

Rub the benzoic acid with three parts of distilled water, and add the water of ammonia, or so much of it as is required to produce a neutral solution. Dilute this with seven parts of warm distilled water and filter, if necessary. Precipitate the liquid by means of the solution of chloride of iron previously diluted with 200 parts of warm distilled water. When the precipitate has subsided, pour off the supernatant liquid, collect the precipitate on a strainer, and wash it with distilled water until the washings are no longer rendered cloudy by nitrate of silver. Finally dry the salt at a temperature of about 30° C. (86° F.)

The resulting salt is a flesh-colored powder, odorless and tasteless, insoluble in water, losing 4.5 per cent in weight by drying at 100° C. (212° F.), and containing about 15.5 per cent of iron.

Oleum Lini Sulphuratum. Sulphurated Linseed Oil.

	Parts.
Linseed oil	1
Washed sulphur	6

Mix and heat them together, in a porcelain capsule, at a temperature between 120° and 130° C. (248° to 266° F.), under constant stirring, until the sulphur is dissolved.

A dark-brown liquid, having a yellow color in thin layers, and completely soluble in oil of turpentine

Oleum Terebinthinæ Sulphuratum.

Sulphurated Oil of Turpentine.

[Balsamum Sulphuris Terbinthinatum. Haarlem Oil.]

	Parts.
Sulphurated linseed oil	1
Rectified oil of turpentine	2

Mix and filter.

The product is a bright, red-brown oily liquid.

Ferrum Dialysatum in Lamellis. Dialyzed Iron in Scales.

Solution of dialyzed iron	q. s.

Evaporate it to a syrupy consistence at a temperature of 40° to 60° C. (104 to 140° F.). Spread it upon glass, and dry it by exposure to the air.

Red-brown scales, generally not entirely soluble in water, and containing 75 per cent of iron.

Pasta Escharotica (Canquoin's). Canquoin's Caustic.

No.	1.	2.	3.	4.
Chloride of zinc, parts	1	1	1	1
Wheat starch or linseed meal, parts	2	3	4	5

Mix them to a paste by means of water, roll it out, form it into suitable pieces, and deliver them in well-closed bottles.

The paste should be freshly made when wanted for use.

Pepsinum. Pepsin.

Pepsin may be prepared from pigs' stomachs by washing the mucous coat, chopping it fine, and macerating it for two days with water acidulated with hydrochloric acid, or with a mixture of water and glycerin. The pepsin is precipitated from the solution either by a saturated solution of chloride of sodium or by alcohol; and the precipitated pepsin is dried in a vacuum at a temperature below 40° C. (104° F.).

Pure pepsin is a brownish-yellow, amorphous, very hygroscopic mass, soluble in water and dilute acids. These solutions do not coagulate on boiling, and are scarcely precipitated by acetate of lead and chloride of platinum.

Commercial pepsin varies considerably in color and hygroscopic property, according as it is mixed with different substances, as milk sugar, etc. In general, good pepsin should respond to the following tests:

Dissolve 0.1 *gm.* of pepsin in 100 *gm.* of distilled water, and 2 *gm.* of hydrochloric acid; then add 10 *gm.* of white of egg, coagulated at a temperature of 95° C. (203° F.). Let the mixture stand for forty-eight hours, occasionally shaking it, at a temperature of about 40° C. (104° F.). The white of egg should thereby be completely dissolved, or the undissolved portion should not amount to more than 0.5 *gm.*

The more rapidly the white of egg is dissolved and the smaller a precipitate is produced in the solution by nitric acid, the better is the pepsin.

Quiniæ Carbolas. Carbolate of Quinine. [Quiniæ Phenylas.]

	Parts.
Carbolic acid	6
Quinine (alkaloid)	10
Alcohol (0.820)	30

Dissolve the carbolic acid in the alcohol, warm the solution, add to it the quinine, then filter, and evaporate the filtrate to dryness upon the water-bath.

The product is a white powder, soluble in 400 parts of water and in 80 parts of alcohol. It is rendered violet by solution of ferric chloride.

Zinci Phosphidum. Phosphide of Zinc.

Phosphide of zinc occurs either in brittle lumps, having more or less a metallic lustre, or in form of a gray, metallic, fine powder, having an odor or phosphorus, permanent in the air, and of the specific gravity 4.7. When heated out of contact with air, it is completely volatilized; with access of air, it is converted into phosphate of zinc. Acids decompose it, setting free phosphoretted hydrogen, and forming the corresponding zinc salts. Alkalies leave it unaltered.

When examined by a lens, the salt should not show the presence of unaltered metallic zinc. *One* part of the finely-ground powder, covered with a solution of chloride of ammonium, and digested for one day, should yield a precipitate which, when collected on a filter and washed successively with water, strong alcohol, and ether, and dried in the air, should weigh at least 0.9 parts.

Phosphorus Pulveratus. Powdered Phosphorus.

Phosphorus, cut in pieces	q. s.

Drop the phosphorus into a flask half filled with a solution of chloride of sodium. Warm the mixture until the phosphorus melts. Then shake it until the liquid becomes cold. Pour off the solution of the salt and wash the powdered phosphorus thoroughly with water.

It should be preserved under water.

Pomatum Dupuytren. Dupuytren's Pomade.

	Parts.
Extract of cinchona fusca (cold prepared)	12
Lemon-juice	6
Tincture of cantharides	6
Beef-tallow, fresh	96
Oil of Bergamot	1

Dissolve the extract of cinchona in the lemon-juice and tincture of cantharides, and add the other ingredients.

Pulvis Cinchonæ Succirubræ (Javanicæ seu Indicæ.) Powdered Red Cinchona (Javanese or East Indian.)

The powder of any red, cultivated cinchona bark, yielding at least 6 per cent of total alkaloids. The quantity of the latter is to be ascertained by the following process of assay:

	Grams.
Bark of the stem of Javanese or East Indian red bark, in fine powder	10
Normal hydrochloric acid	10
Oxalate of potassium	0.15
Solution of soda (10%)	q. s.
Distilled water	q. s.
Acetic acid	q. s.

Macerate the powder with 30 *gm.* of distilled water and 10 *gm.* of normal hydrochloric acid during twelve hours, frequently stirring. When the froth has settled, transfer the mixture to a percolator, the lower orifice of which is closed by a linen pellet (or other contrivance), and percolate with distilled water, until a few drops of the liquid passing through are no longer rendered cloudy by solution of soda.

Mix the liquid carefully with dilute solution of soda until a slight cloudiness makes its appearance; then add just enough dilute acetic acid to cause the cloudiness to again disappear. Heat the clear liquid to near the boiling point, and add to it the oxalate of potassium dissolved in water. Filter off the resulting precipitate, wash it, and add to the filtrate an excess of soda solution.

Collect the resulting precipitate upon a double filter, wash it, first with dilute soda solution and afterwards with distilled water, until the washings are almost colorless. Dry the precipitate by exposure to air until it can be easily detached from the filter; then transfer it to a tared capsule, and dry it on the water-bath.

The weight of the precipitate multiplied by 0.041 *gm.* for every 100 cubic centimeters of mother liquid and wash-water, indicates the quantity of total alkaloids in the 10 *gm.* of the powder.

N.B.—Normal hydrochloric acid is standardized upon normal solution of soda and this is standardized upon normal solution of oxalic acid.

Normal oxalic acid contains 63 *gm.* of the pure acid in 1,000 *cc.*

Normal soda solution contains 40 *gm.* of pure sodic hydrate in 1,000 *cc.*

Normal hydrochloric acid is made by mixing 120 *gm.* of hydrochloric acid (spec. grav. 1.160) with about 750 cubic centimeters of distilled water, and trying how much normal soda solution is required to exactly neutralize 10 *cc.* of this solution. From the figure obtained calculate the amount of distilled water which must be added so that it takes exactly 10 *cc.* of the acid to neutralize 10 *cc.* of the alkaline solution.

Ferri Saccharas. Saccharate of Iron. [Ferri Oxidum Saccharatum Solubile.]

	Parts.
Solution of chloride of iron (ferric), sp. gr. 1.480	2
Syrup	2
Solution of soda (sp. gr. 1.33), a sufficient quantity, or about	3
Sugar	q. s.
Distilled water	q. s.

Mix the syrup with the solution of chloride of iron, and drop the mixture, while stirring, into so much solution of soda that the precipitate first formed is redissolved. Let the mixture stand for twenty-four hours; then pour the clear liquid into 30 parts of boiling distilled water, and let it deposit, after stirring it up.

Pour off the clear liquid from the precipitate, collect this upon a filter, and wash it with warm distilled water as long as it runs off colorless and has an alkaline reaction. Then let the precipitate drain, transfer it to a capsule, mix it with 9 parts of sugar, and dry the mixture, while stirring, on the water-bath, and finally add enough sugar to make the whole product weigh 10 parts.

Saccharate of iron is a brown-red powder, having a sweet, faintly metallic taste, and, when mixed with 5 parts of water, dissolving to a faintly alkaline liquid. The reaction for iron compounds is not developed in this liquid until it has been acidulated by hydrochloric acid.

It contains 3 per cent of iron, and should be preserved in well-closed vials.

(To be continued.)

Chinoline Mouth-Wash.

Chinoline tartrate	3 parts.
Oil of peppermint	2 "
Alcohol	40 "
Distilled water	280 "

A teaspoonful to a wineglassful of water forms an excellent, refreshing, and antiseptic mouth-wash.

Artificial Indigo.

THE first number of the journal of the Society of Chemical Industry contains an interesting letter to Professor Roscoe from Professor Baeyer, the discoverer of artificial indigo. The letter is specially interesting as a comment on the *canard* circulated through the press,* announcing the failure of the invention and the abandonment of the manufacture of artificial indigo. We give an abstract of the letter. Professor Baeyer has recently visited the Baden Aniline and Soda Works, where the new-old dye is manufactured.

The manufacture of artificial indigo depends on the preparation of ortho-nitro-phenyl-propiolic acid,† known in commerce as propiolic acid. The first necessity in its preparation is a cheap cinnamic acid. This is now made by the Baden company by fusing benzyl chloride with sodium acetate, dispensing with the use of acetic anhydride and oil of bittter almonds. "I was amazed to see hundredweights of cinnamic acid undergoing treatment with nitric acid, for I remembered how difficult it was to work up a single pound in the laboratory." Cinnamic acid is converted into ortho-nitro-cinnamic acid in two processes. First it is converted into its ethyl ether, which is then treated with a mixture of nitric and sulphuric acids, certain precautions being observed. The solid mixture of ortho- and para-nitro-ethers thus obtained is heated with alcohol, the ortho-ether being dissolved and deposited from alcoholic solution in large yellowish crystals. This, on saponification, yields ortho-nitro-cinnamic acid. The propiolic acid is obtained from this by treatment with bromine, by which means the dibromide is formed, which is then dissolved in caustic soda ley with the formation of sodium propiolate. The acid itself is precipitated from the solution of the soda salt by means of an acid, and is sent to market as a paste containing twenty-five per cent of acid. The acid is what is used by the dyer. A mixture of propiolic acid and sodium xanthate, properly thickened, is printed on the cloth. Exposure to the air (aging) develops the color, which is fast, and exhibits the characteristic tints of indigo in both light and dark shades.

The process works with perfect regularity, the only serious imperfection being the loss of forty per cent of cinnamic acid in the form of para-nitro-cinnamic acid. Still, 200 kilos of paste are turned out daily, which is sold at 10*s.* a kilo.—*Chem. and Drugg.*

Permanganate of Potassium in Snake Poisoning.

IT was reported not long ago that M. de Lacerda had found that permanganate of potassium effectively counteracts the poison of serpents. M. Lacerda's experiments were made in South America. Dr. Vincent Richards, of Godundo, Bengal, a well-known authority, has since tested the power of the permanganate to neutralize the poison of the venomous snakes of India. His first report has been published in the *Indian Medical Gazette* of January 2d, 1882, and a summary of it was published in the *Medical Times and Gazette* of January 28th, 1882. Dr. Richards reports thirty-three experiments; twenty dogs, ten fowls, and one duck were operated on. In thirteen instances more than a fatal quantity of cobra poison, dissolved in water, was mixed with permanganate and introduced beneath the skin or into a vein, and no symptoms of poisoning followed in any case. But it was found by four experiments, that if the poison were dissolved in glycerin instead of water, the addition of permanganate appeared to have no power over the virulence of the poison. Dr. Richards then endeavored to ascertain how long an interval might elapse after the injection of the poison until the injection of the antidote. The permanganate was administered one minute after the poison and no symptoms followed; in another case two minutes, in another three, and in another four minutes after, and still no symptoms followed. Next an interval of seven minutas was allowed, but the dog died in about an hour. Dr. Richards is doubtful, however, whether in this case the permanganate had been properly injected. He found by other experiments that permanganate had no prophylactic properties, nor had it any effect on an animal when poisoning symptoms had set in. The proportion of permanganate he used was one and one-half grain in nine grains of water. The experiments are interesting, but they do not seem as yet to offer any solid ground for hope that a practical antidote has been found. Besides the necessity of injecting the antidote almost coincidentally with the poison, it seems hardly certain whether the poison as imparted by the snake is in the condition of an aqueous or of a glycerin solution.—*Chem. and Drugg.*

* See also NEW REM., February, 1882, 57.

† A new method of preparing indigo has been discovered by Prof. Baeyer, which will be detailed elsewhere.—ED. NEW REM.

Varnish for Drawings, Maps.

A VARNISH for paper which produces no stains may be prepared, according to the *Polyt. Notizblatt*, as follows:

Clear damar resin is covered, in a flask, with four and a half to six times its quantity of acetone, and allowed to stand for fourteen days at a moderate temperature, after which the clear solution is poured off. *Three* parts of this solution is mixed with *four* parts of thick collodion, and the mixture allowed to become clear by standing It is applied with a soft camel's or beaver's hair-brush in vertical strokes At first, the coating looks like a thin white film; but, on complete drying, it becomes transparent and shining It should be laid on two or three times. It retains its elasticity under all circumstances, and remains glossy in every kind of weather.

The Ethereal Oil of Mastic.

THE *Pharmacographia* (2d edition, p. 164) states that mastic contains a very small quantity of an essential oil. This statement is scattered through chemical literature, although there appear to be no records of any actual experiments. Prof. Flückiger has received from Messrs. Schimmel & Co., of Leipzig, a sample of this essential oil, with the information that mastic yielded as much as two per cent. The resin, of which a sample was also sent to Prof. Flückiger, did not differ from the usual Chian mastic, and appeared to be very fresh.—*Arch. d. Pharm.*, 1881, Sept.

Fluid Extract of Chinese Tea.

Best Imperial tea	32 troy oz.
Glycerin	8 fl. oz.
Water	8 fl. oz.
Alcohol	16 fl. oz.
Diluted alcohol	q.s.

To the tea, in fine powder, add sufficient of the mixture of the liquids to moisten it, and pack it in a percolator; pour in the remainder of the menstruum, and let it stand 4 days. Then continue the percolation, using diluted alcohol until 24 fl. oz. have been received. Remove the mass from the percolator, and add to it 1 gallon of boiling water. After macerating 24 hours, express, filter, and evaporate to 8 fl. oz., mix with the percolate, and filter.

This fluid extract has been found to exceed either coca or guarana in relieving headache.—R. F. FAIRTHORNE, in *Am. Journ. Pharm.*

Compound Syrup of Tar.

(Bosche's German Syrup.)

Oil of tar	1 3
Fluid extract of ipecac	4 3
Tincture of opium	4 3
Fluid extract of wild cherry	6 3
Carbonate of magnesium	3 3
Water	8 fl. oz.
Sugar	14 "

Triturate the oil thoroughly with the magnesia in a mortar, mix the fluid extract with the water and incorporate with the mixture in the mortar, then filter, and in the liquid dissolve the sugar by agitation.

The Composition and Quality of Certain American Wines.*

THE annual production of American wines has reached such proportions that it has been deemed advisable to begin, at least, a careful chemical examination of the more prominent brands, both for the security of consumers and the information of manufacturers.

As wine is a liquid of very complex composition, and, as certain foreign wines can be sold in this country at very low prices, there is great danger that the illegitimate arts of the professional "improver" will, in great measure, nullify the results attained by the more honorable winemaker. In fact, the investigations thus far made conclusively show that the ability to "doctor" and falsify wines is not lacking in this country. Just here it should, in justice, be stated that the substances most frequently added to wines are not the gross poisons popularly supposed to be used, but rather alcohol, molasses, glucose made from starch, and, occasionally, some foreign vegetable coloring matters, such as elder berries; and these practices are in reality abetted by the lack of knowledge and the depraved taste of the public, which demands strongly alcoholic or very sweet wines.

It can be safely stated, on the authority of the best chemists who have made wine analysis a study, that true wines are not strongly alcoholic, and usually they are not decidedly sweet.

An extensive number of analyses † has shown that most dry red or white wines do not contain more than 10 per cent (by weight—equal to about 12 per cent by volume) of alcohol. Some cases occur where slightly more than 12 per cent (by weight) of alcohol is present; but while it is possible that such wines might be made by fermentation of very sweet grapes, the chances are that 2 or 3 per cent of alcohol have been added in order to keep wine which would be otherwise instable from bad handling.

As to ports, sherries, and similar strong wines, it is well known that they are all more or less "fortified" by addition of common alcohol, deodorized alcohol ("cologne spirits"), or brandy, and the same may be said of the greater number of sweet wines. The use of such wines in medicine should be discouraged for the reason that there is no security in buying them; and that hardly two samples are at all alike, either in alcoholic strength, sweetness, astringency, or body. Again, all such wines have a tendency to encourage the use of such strong liquors as brandy or whiskey rather than the less harmful light wines Dry or moderately sweet red or white wines are chemically and medicinally better in nearly every case; they can be furnished at reasonable rates, and experience shows that the danger of forming intemperate habits from their use is very much less than where the stronger wines are prescribed.

The very best wines are made from the grape juice ("must") only. White wines can be made from the juice of red or white grapes, provided only the skins are not allowed to remain in the fermenting vats. Red or dark-colored wines are produced normally by fermenting the juice in presence of the skins of dark-colored grapes. The grape color is not soluble in pure water, but becomes soluble in the wine through the action of the alcohol and acids present in the forming wine. The use of foreign colors whatsoever is very objectionable, and should be discouraged by all winemakers.

Wines made by simple fermentation of the grape juice are not likely to contain any sugar, and are called "dry" wines; if white, they have many names, usually derived from the kinds of grapes used, the locality where grown, or some real or fancied resemblance to the finer brands of foreign wines. If they are red, they are often called clarets; these are dry red wines, of rose-red or darker color, moderately acid and astringent, and of an alcoholic strength of 8 to 11 per cent by weight. Burgundy wines are usually darker colored and more astringent. There are many slight differences in odor or taste which serve to distinguish the wines from different grapes, and it is often found to be advantageous to use several kinds of grapes for one wine.

Even wines ostensibly from the same variety of grape differ greatly in taste when received from different makers, and all the wines of certain vineyards have some peculiar after-taste, pleasant or otherwise, which serves to distinguish them from all others.

Ripe or over-ripe grapes, if not mildewed, make the strongest, best-flavored, and best-keeping wines. Grapes not fully ripened are more acid and contain less sugar; hence, they produce weak, sour wines, which are too frequently "improved" by additions of spirit, in order to make them more salable and less likely to spoil.

The temperature at which fermentation is carried on has much to do with the quality of the wine. If the cellar is rather warm, the fermentation is rapid, the growing yeast-cells are thrown to the top of the liquid ("top-yeast"), and the wine produced is inferior in quality. If the fermentation goes on at a lower temperature, the yeast-cells sink ("bottom-yeast"), more time is required, but the wine is of better quality.

Free exposure to the air after this first fermentation is undesirable, as it tends to increase the acidity of the wine, the oxygen of the air changing more or less of the alcohol to acetic acid, the characteristic acid of vinegar. Besides this, there is considerable danger that certain diseases, at present not thoroughly understood, will set in and spoil the wine. For these reasons but slight access of air is allowed. Most wines go through a slow second fermentation in the barrel. After this is completed, they can be kept in tight casks, or, better, in bottles laid on their sides, or placed in racks, cork down, in cool cellars.

Sparkling or "champagne" wines are properly made by fermentation in nearly full, corked bottles. As during fermentation it is practically (at least approximately) true that two parts of sugar furnish one part of each of alcohol and carbonic acid gas, it will be seen that a very considerable amount of gas is contained under pressure in each bottle. Upon pouring the wine out and exposing it freely to the air, it parts with the greater portion of this gas and is correspondingly less brisk, but it still contains more dissolved gas than could be retained by water under the same circumstances, owing to the greater solubility of carbonic acid gas in alcohol than in water

That certain cheaper grades of native champagnes are artificially charged with gas seems quite probable, but this is a statement very hard to prove by positive chemical evidence. And, further, it is doubtful whether such artificially-charged wines would be any better or worse than those made by the regular process, provided the wine used as a basis were as good as that remaining after expelling the gas from a true champagne In absence of carefully-recorded experiments, and in view of the fact that no manufacturer will own that he uses any other than the regular methods, this is a question still to be answered. This much is true, however, that he who sells an artificially-charged champagne as one made by the regular method is guilty of falsehood, and would not be likely to be overscrupulous as to the quality of the wine he used, provided only that it were salable. To sell these "gas wines" as such is the only honorable method.

Let us now consider the question as to the value of wine analyses. In the first place, the analysis of any wine, however complete it may be, can show only certain qualities or peculiarities of the sample, and must always leave untouched many questions relating to the more delicate shades and differences in quality, which have very much to do with the value of the wine. The mere examination of

* By HENRY B PARSONS, PH C, in the *eport of the Commissioner of Agriculture for* 1880 Washington, 1881. In view of the fact that the new pharmacopœia will probably drop the sherry and port wine heretofore directed, and substitute therefor white and red wine of definite properties, such as can be readily fulfilled by domestic wines, the above paper will be of special interest for pharmacists.

† The original paper is accompanied by detailed tables, showing the name, source, and composition of one hundred and eighty-four samples of American wines. We are compelled for want of space to omit them; but we have no doubt that, on application to the Commissioner of Agriculture (Dr. Loring), a copy of the report will be sent to any one who desires it.—ED. N. R.

the analysis of any wine cannot show whether that wine has a pleasant or a disagreeable odor or taste, but within certain limits it can show whether the constituents estimated are in proper quantities. Rightly interpreted also, these figures go far to show the character and skill of the maker, and, although the analyst may not always feel that he has sufficient evidence to prove fraud or deception, still he is frequently convinced thereof. In certain cases, there can be no doubt of sophistication; in others, the additions have been so slight and so carefully made as to render it very difficult to prove them.

The composition of wines normally made from various kinds of grapes is pretty well known in European countries, and any great deviations from the there accepted standards is considered due to falsification, for which appropriate penalties are imposed; but a large and comprehensive series of analyses of American wines, from all sources, seems not yet to have been made. The analyses made in this department have had for their chief object the settlement of the question as to the composition of the best American wines as furnished for analysis by the manufacturers, and, secondly, the composition of the American wines actually furnished to consumers.

Circular letters were sent to a number of the more prominent manufacturers and dealers in American wines, asking for samples of their various brands, and in nearly every case the goods were promptly shipped. It is fair to suppose that the wines so obtained represent the best American product in most cases, and it may here be remarked that the dry white and red wines were in many cases of a very fine quality, and gave evidence of skill in manufacture and handling.

Besides these wines, a considerable number were purchased of responsible retail dealers in the city of Washington. In nearly every case the samples were in original bottles, with the label affixed of the manufacturer; a few were drawn from the cask, and a very few were of unknown origin. In some cases, the wines so obtained were equal in quality to those obtained from the manufacturers; in certain other cases, the purchased wines had the same general character, but were more acid and less alcoholic, showing the use of less carefully selected grapes. Probably the care taken of many of these wines was not always such as it should be. Often, also, it was impossible to ascertain the vintage year for certain samples. In a general way, it may be said that the dry wines were frequently quite good, and in certain cases fully equal in quality to those obtained from the manufacturers. The so-called American ports and sherries are not to be commended, for many of them seem to have been made by bunglers, whose sole object seems to have been to use the cheapest sugar or molasses and the poorest and cheapest form of alcohol, brandy, or whiskey Some exceptions there are, but the best articles have not the characteristic taste, color, odor, etc., of good sherry or port.

An examination of the analyses of the various sweet wines will reveal the great differences in their composition. Surely a wine containing from one-sixth to one-fourth of its weight of sugar alone is not one to be commended on the score of healthfulness; if, at the same time, the wine is strongly alcoholic, the evil is increased, for it should be remembered that of two wines (a dry and a sweet) showing the same percentage by weight of alcohol, the heavy wine contains in the same volume frequently considerably more real alcohol than does the lighter dry wine.

In comparing such wines, the best judgment as to their relative alcoholic strength may be formed from an inspection of the column showing "per cent of alcohol by volume," for the reason that consumers of wines always think of the amount of alcohol in a given volume. Thus judged, it appears that many sweet wines have nearly or quite twice the alcoholic strength of natural dry wines.

This greater alcoholic content can only be obtained by the addition of alcohol in some form. It will be for the best health of consumers to use natural dry wines, or wines only moderately sweetened and moderately alcoholic.

So soon as the professional "improver" is allowed to use his peculiar methods and formulæ there is no longer any safety. A law regulating these matters, if carefully framed and honestly administered, would in time be found to promote the interests of legitimate wine makers. It is to be hoped that the demand for true wines may tend to crowd out these products of the "improver"; it is certain that many wine makers are forced against their inclination, by the demand, to make these wines, although they would prefer to sell a more natural article.

Of the champagnes, it may be said that, on the whole, their quality was surprisingly good. Two or three samples were either unwarrantably sweet or had some slightly unpleasant taste.

As a general thing, the quality of champagnes is better the less sugar they contain, but their palatability does not depend on this alone. The amount of gas, acidity, and peculiar flavors derived from the grape have much to do in determining the value. Several brands would compare very favorably with imported champagnes of good reputation.

The very sweet brands are quite likely to cause headaches, well known to many as the after-effects of the too free use of any sweet wines.

Very great differences in "body" were noticed; by this term "body" is understood a certain full, nourishing taste suggestive of considerable dissolved matters, but very hard to describe accurately. A wine lacking this "body" cannot be considered really good, even though it may have otherwise a pleasant flavor and odor. For this, as for numerous other qualities of wines, chemical tests are unsatisfactory and liable to be misleading; the judgment of an impartial and practised wine taster is of first value.

Dry red American wines have, as a general thing, a higher specific gravity, more total residue and ash, and are slightly more acid and less alcoholic than dry white wines of American manufacture; further, there is less variation, in most particulars, between the highest and lowest results obtained in analysis of dry red wines.

It must be admitted that the total acidity, as well as the considerable amount of acetic acid contained in many American wines, is rather too high; it results from the use of grapes not fully ripened and not carefully selected, from the rapid fermentation in warm cellars, and from too great exposure to the air of the nearly or quite finished wines (causing partial acetification). The German wine makers aim to produce wines whose total acidity (stated as tartaric acid) shall not exceed 0.6 per cent, and with few exceptions they succeed. This is a matter worthy the careful attention of American wine makers.

Sharp competition in prices has led to the addition of sugar and water to the must in many cases, in order to increase the amount of wine produced and lessen the cost. Although this is done in all countries, it is still to be regretted, for, while quite palatable wines may be produced, they lack that full body and flavor only to be had by fermenting the juice of the grape without additions. That there are certain bad years when grapes are so acid and deficient in sugar as to render the addition of a moderate amount of the latter necessary is not to be denied, but in ordinary or good years no additions are required. The wines thus normally produced would cost more in some cases, but they would be far superior in quality and worth the increased price. The judicious selection of varieties, and often the use of one kind of grape known to be prolific in conjunction with some other variety of more desirable flavor, but giving a smaller amount of grapes, will often insure both a large yield and a superior quality of wine. Many wines which have been made from sweetened and diluted must are found deficient in fixed acid, while they contain an excessive amount of volatile acid.

It has been the aim to show by these analyses the actual composition of American wines, and a careful study of the analytical figures, in the light of what has here been written, will serve to give a fair idea as to the general quality of such wines at the present day. It may briefly be stated that a very considerable number of vineyards, in nearly every section of the country, produce fair to good dry

wines; some makers furnish very good champagnes; a few fair very sweet wines have been examined. It is not thought best to here compare the wines of one manufacturer with those of another, for failure to produce fine wines seems often to have been due more to inexperience than to intentional adulteration.

The work already accomplished should be only preliminary to the careful study of the whole question of American wine-making. One or two competent chemists could be continuously engaged for years in making careful examinations of grapes, must, and wines, not only such as have been here recorded, but in the investigation of the effects of different methods of treatment in the various stages of fermentation and "aging," the examination of those constituents existing in all wines in small amounts (glycerin, succinic acid, tannin, color, "bouquet," albumen, phosphoric acid in the ash, etc.), and in fact the elucidation of numberless vexed questions. It is to be hoped that means may be afforded this department for the more elaborate and thorough study of this important industry.

CONSTITUENTS, ETC.	DRY RED WINES.			DRY WHITE WINES.		
	Average sixty-four Analyses	Highest.	Lowest.	Average fifty-one analyses.	Highest.	Lowest.
Specific gravity	0.9933	1.0011	0.9894	0.9926	1.0105	0.9845
Per cent alcohol, by weight	8.92	12 21	5.71	9.35	13.94	7.03
Per cent alcohol, by volume	11.04	15.21	7.17	11.70	17.37	8.80
Per cent total residue	2.28	3.16	1.65	1.75	2.64	1.18
Per cent total ash	0.231	0.532	0.130	0.181	0.335	0.090
Per cent glucose	Traces.	0.450	None.	Traces.	0.300	None.
Per cent total acid, as tartaric	0.723	0.997	0.511	0.680	0.855	0.422
Per cent fixed acid, as tartaric	0.360	0.646	0.226	0.313	0.561	0.121
Per cent volatile acid, as acetic	0.290	0.517	0.138	0.294	0.508	0.068

On the Influence of Chlorides upon Nessler's Reagent.

DRS. OTTO GROTHE and L. H. FRIEDBURG give a preliminary notice (in the *Deutsch-Amer. Apoth. Zeit.*, Feb. 1st) that, if Nessler's reagent is added to solution of ammonia, which contains certain quantities of chloride of magnesium, no visible reaction ensues, that is, the well-known reddish-yellow precipitate fails to make its appearance although the solution may have been rendered alkaline. The discoverers reserve the right to study the influence of chlorides upon the reagent.

New Indicators for Alkalies and Acids.

1. H. W. LANGBECK recommends *Nitrophenol*, which produces no coloration in acid or neutral liquids, but is stated to impart a distinct *yellow* tint in presence of traces of alkali, even if the indicator has been added in the proportion of only 1 part in 100,000. Naturally, this indicator can be used only in liquids which have but very little color, or are colorless.*

2. J. Oser and Wilh. Kalmann† have discovered a new body likewise serviceable as an indicator. It is prepared by treating gallic acid with permanganate of potassium and sulphuric acid, whereby a yellow crystalline substance is obtained, having the composition $C_{14}K_{10}O_8$, which the authors have named tetra-hydro-ellagic acid. On fusing this substance with caustic potassa, it is converted into a new body, having the same ultimate composition. It is the latter which serves as an indicator.

The exact method for preparing the indicator from the tetra-hydro-ellagic acid is as follows:

Fuse the acid, added in small portions, with five times its weight of caustic potassa, until the mass shows a dark violet-red tint at the edges of the silver dish in which the fusion takes place, and until a sample of the fused mass, when saturated with sulphuric acid, ceases to produce a bright orange-yellow precipitate, but yields one of greenish-yellow color. The whole mass is then treated like the sample, the substance separated by the acid is transferred to a filter and washed with cold water. It is next dissolved in boiling water, and, on cooling, is separated in fine microscopic needles. After repeated purification, a yield of about eleven per cent of the original substance is obtained.

On stirring some of this substance in water, and gradually adding a caustic alkali, the substance is at first dissolved with an olive-green color; but as soon as an excess of alkali is present, the liquid acquires an intense red color, especially if shaken with air. This solution has such an intense coloring power that a few drops are sufficient to impart a distinct red color to a large quantity of acid. On carefully adding hydrochloric or sulphuric acid to such a liquid, the least excess of acid changes the red tint to yellow. Hence such a solution, exactly neutralized by an acid, may be used as a very delicate indicator.

It is particularly remarkable that the red color of the alkaline solution is not in the least affected by carbonic acid, even when this is present in excess. Indeed, the carbonates of the alkalies, as well as ferrous or manganous carbonates, behave exactly like alkalies, so that the indicator may be used for the determination of the "combined" carbonic acid in water analysis.

3. Paul Degener‡ states that, by heating 1 molecule each of phenol, concentrated sulphuric, and glacial acetic acid, for several hours, under an upright condenser, a mixture of two resinous bodies is obtained, one of them being brown, and the other green, the latter being less easily soluble in boiling water than the former. Both of these substances may be used as indicators. They are dissolved in alcohol, and a small quantity of the solution is added to the liquid to be titrated. The author recommends especially the brown substance, which he has called *phenacetalin*. This imparts a red color to an alkaline liquid, the color completely disappearing as soon as the liquid becomes neutral or acid. Only alkalies and alkaline earths produce the red color, while the carbonates are indifferent (the alkaline carbonates assume only a slight tint). The author considers the indicator specially suitable for the determination of alkalies alongside of alkaline carbonates. But as the delicacy of the indicator is much greater for distinguishing alkaline earths from their carbonates than in the case of alkalies and their carbonates, he recommends to get rid of the latter by an excess of barium chloride.—*Zeitschr. f. anal. Chem.*, 1882, 100.

* *Chem. News*, 43, 151.
† *Monatsheft für Chemie*, 2, 50.
‡ *Zeitsch. d. Ver. f. Rübenzucker Ind.*, 1880, p. 357.

Cuprea Bark and its New Cinchona Alkaloids.

D. HOWARD and J. HODGKIN have discovered in the bark of the China Cuprea (or Cupræa) described by Dr. Flückiger, an alkaloid which appears to be peculiar to the species, which is quite distinct from that described by Arnaud, under the name of cinchonamine (see NEW REM., Jan., 1882, 8). This bark, first imported in 1871, differs much in its extreme hardness and tenacity from all other cinchona barks. During the last few months, large quantities have been sent over from Buccarramanga, in the province of Santander, where it is said to form vast forests. The bark varies greatly in value, some specimens containing no quinine, others upwards of two per cent; some quinidine and cinchonine are also found in the bark, but no cinchonidine. The new alkaloid, in its general properties and composition of its platinum salt closely resembles quinine. It differs only in the solubility of its salts and the readiness with which the alkaloid crystallizes from ether. The authors suggest the name homoquinine. 100 *cc.* of ether dissolve 0.57 of the alkaloid at 12°. It is much more soluble when other alkaloids are present, and is very apt to show supersaturation. The sulphate crystallizes in shorter needles than the quinine salt, and contains six atoms of water. Water at 100° dissolves 1 per cent; at 12°, 0.25 per cent. The disulphate is extremely soluble and fluoresces. The oxalate, tartrate, hydrochlorate, nitrate, and hydriodate were also prepared. The rotation of the alkaloid and its salts is almost identical with that of quinine. Further investigations on larger quantities of the alkaloid are promised.

The preceding statements were made by the authors at a meeting of the Chemical Society of London, held Dec. 15th, 1881, and in the discussion which followed, Mr. Cownley said that, in conjunction with Dr. Paul, he had discovered some months back an alkaloid in Cuprea bark which differed from the other well-known cinchona alkaloids. They had experienced some difficulty in obtaining it pure, but, during the last few weeks, had succeeded. The communication was already in type, and would appear in the *Pharmaceutical Journal* of this week. He was, therefore, very much surprised to hear Messrs. Howard and Hodgkin's paper, which apparently described the same alkaloid.

In answer to several questions, Mr. Howard said that, in the present state of legislation, he had not thought it desirable to test the physiological action of this alkaloid on any other vertebrate than himself. The amount of alkaloid varied, but was usually about ten per cent of the quinine present. He was quite delighted to hear that the presence of this alkaloid had been simultaneously confirmed by the experiments of Mr. Cownley.—*Chem. News*, Dec. 23d, 1881.

Note on Commercial Chinoline (Quinoline).

IN the different notices that have lately appeared, and in the advertising circulars now being distributed by the English agents of certain German manufacturers, it appears to be taken for granted that leucoline from coal-tar, chinoline from cinchonine, and the chinoline as prepared by Skraup's process, are identical bodies.

It was established years ago by Greville Williams that leucoline and chinoline were by no means absolutely identical, two very marked reactions distinguishing the one from the other. Chinoline from cinchonine gives, with potassium bichromate, a yellow crystalline precipitate, and with amyl iodide the beautiful blue color known as cyanine. Leucoline from coal-tar does not give either of these reactions.

To determine the behavior in these respects of the chinoline now being introduced into the market, I obtained a sample from a West-end pharmacist who got it from Germany for me. The liquid was labelled "pure," and was of a deep-brown color, with a strong smell of bitter almonds. On treating this with dilute hydrochloric acid, a large proportion was found to be insoluble, and was simply unconverted nitro-benzol. To the dissolved portion was added a solution of potassium bichromate, which immediately blackened it, throwing up in a few minutes a black tar. There was no appearance of any precipitate for some time; but after the liquid had stood for some days, a slight crystalline precipitate was found, which was dissolved and recrystallized, giving bright-yellow stellar crystals.

On the addition to one drop of the original sample of a solution of chlorinated lime, the characteristic aniline purple was readily manifested.

Apparently, this so-called pure chinoline is largely a mixture of aniline and nitrobenzol.

A sample of *tartrate* from the same source, when dissolved, gave with caustic soda a deep sky-blue color, which remained permanent for some hours, gradually becoming brown. Other samples of tartrate I have examined do not give this reaction, which is doubtless due to some impurity.

[The tartrate of chinoline at present in the New York market seems to be pure, as we have not met with any which gave a colored reaction.—ED. N. R.]

Another sample of chinoline, also of German manufacture, obtained from another source, was labelled pure and of a bright sherry color, and contained distinct traces of aniline and nitrobenzol, and had to a marked extent the characteristic chinoline smell. It did not darken on the addition of potassium bichromate, but gave a copious yellow crystalline precipitate. I utterly failed, however, to obtain the least trace of cyanine on treatment with amyl iodide, although this color is readily formed in the case of pure chinoline (from cinchonine).

Dr. Donath [see abstract of paper given in NEW REMEDIES, 1881, 364] says that the chinoline he experimented with gave, with potassium bichromate, carefully added, delicate dendritic crystals, *soluble* in excess of the reagent. The chinoline I have examined gives readily a crystalline precipitate quite *in*soluble in excess, so that not only does it differ from leucoline, and, to some extent, from cinchonine-chinoline, but samples manufactured by the same process also present points of difference. Probably, the German chinoline is a mixture of homologous bodies, and a thorough investigation as to its composition seems desirable. In the mean time, I am not aware whether the liquid chinoline itself is used for internal administration, but in circulars that have come to my hand, it is distinctly recommended in the antiseptic treatment of dental caries, so that it is as well to see how far the so-called chinolinum purum is merely a mixture of aniline and nitrobenzol, as the use of these bodies might be attended with unpleasant effects.—CHAS. EKIN, F.C.S., in the *Pharmaceutical Journal*, Feb. 11th.

Bamboo for Oregon.

THE American Consul-General at Shanghai has lately sent twenty boxes of Bamboo cuttings for transplanting in Oregon. He writes to the State Department that in the Chinese Empire, south of the Yang-tze, about sixty varieties of bamboo are said to grow, although five or six furnish the principal materials used. At Foochow and Swatow, the large size grows to forty or fifty feet high, and six or seven inches diameter; on the Island of Formosa it is found even larger.

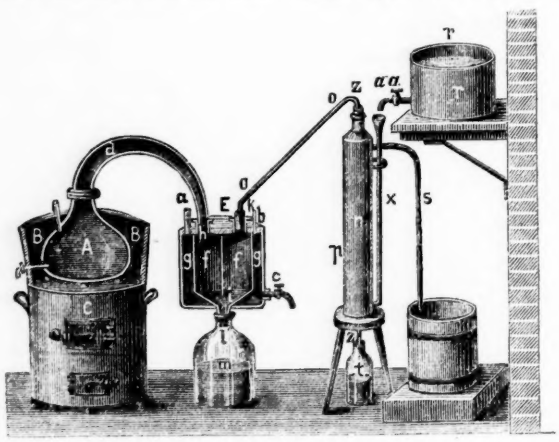
The bamboo serves at least five hundred different purposes in China. The roots are carved into images, lantern handles, and canes, the tapering culms are used for every conceivable place where poles and ribs can be put; the leaves are worked into thatches, umbrellas, and screens; cut into splints, the wood is woven into baskets, plaited into awnings, and twisted into cables; the shavings stuff pillows; other parts supply chop-sticks for eating, beds for sleeping, brooms for sweeping, pipes for smoking, fuel for cooking, skewers for the hair, paper for writing, rods for whipping, tables to eat on, buckets for water drawing, and the tender shoots are highly esteemed as a vegetable to be eaten.

The Consul-General urges the naturalizing of the bamboo in the southern States, and on the Pacific coast.

The Manufacture of Flavoring Essences.

THE demand for flavoring, or so-called fruit-essences has largely increased during the last decade or two, owing to the increased consumption of carbonated beverages, artificial liqueurs, confectionery, and perfumery. The greatest care must be exercised in the selection of the crude materials, in order that the products may be free from foreign odors. Only the purest alcohol must be used, and while the distillation may be performed in copper boilers lined with lead, the first product must be rectified in glass-vessels.

These essences being chiefly ethers, some of which are quite volatile, particular attention must be paid to thorough cooling of the vapors. This is done by passing ice-cold water through the condenser, and surrounding the receiver with ice. If a still lower temperature is required, a mixture of chloride of sodium and saltpetre may be sprinkled upon the ice, and this will frequently be necessary during summer. The condensing tubes may be of copper, but must be carefully cleaned, after every distillation, to prevent oxidation of the metal. For the rectification it is best to use Liebig's condensers with glass tubes.



Apparatus for the Manufacture of Flavoring Essences.

The distillate should be received in glass vessels, which ought to be tied over with bladder, and the latter should be punctured with a needle in order to permit any accumulated gas or vapor to escape. When operating on a large scale, a special glass tube proceeding from the receiver should communicate with the outer air, to prevent the accumulation of inflammable products in the work-room. Great caution should be exercised in the use of light and fire, and if the operation is at all upon any considerable scale, the fire-room should be outside of the work-room, and completely separated from it by a solid wall. The first products should be removed from the work-shop as soon as possible, and should be preserved in not too large glass vessels packed in straw, and kept in a cool place.

The first distillates must, in every case, be rectified with calcined magnesia, which latter will neutralize any free acid which may have passed over during the distillation. The rectified and finished product must be preserved in well-corked vessels, in a moderately cool place, not subject to considerable changes of temperature. A cellar is the most suitable place, and tin boxes probably the best container.

Many of these ethers improve by age, though some are apt to become slightly acid. If the latter is the case, they should be once more rectified with calcined magnesia.

The rectification may be performed in glass retorts imbedded in sand-baths heated by a charcoal fire through a fire-hole in a wall which completely separates the fire-place from the work-shop. Of course, instead of charcoal, gas may be used; but, in this case, a piece of wire gauze should be interposed, so that the flame may not come in actual contact with the bottom of the sand-bath.

It is, however, much preferable to employ a water-bath, and the apparatus may be constructed somewhat in the following manner, though the shape and size of the different pieces may be modified according to the necessities or conveniences of the manufacturer:

A is a copper retort standing in a water-bath, which may be heated by a sand-bath, or by a charcoal furnace *C*, or, better still, by steam. The neck *d* of the retort is connected, air-tight, with the cooler *E*, consisting of two compartments, of which the outer, *g g*, is filled with water at a temperature of 38–40° C. (100–104° F.), while *f f* is intended for the condensation of vapors of alcohol and water. The mixed vapors from the retort enter the cooler at *h*, pass down to *i*, and then ascend again on the other side of the diaphragm, and finally escape through the tube *o o*. In their passage they lose nearly accompanying vapors of alcohol and water, which collect in the vessel *m*. The ethereal vapors pass over into the second condenser *n*, which is cooled by ice water, and in which the vapors are condensed, collecting in the receiver *t*. The first cooler *E* is provided with a thermometer at *a*, a funnel-tube at *b*, and a stop-cock, *c*, for drawing off the water. In the beginning it is filled with water at 38° C. (100° F.), and when the temperature rises, in the course of the process, the water is let out and replaced by fresh.

Purgative Powder.

Extract of jalap, powd.	24 parts.
Bitartrate of potassium	24 "
Resin of podophyllum	1 part.
Ginger, powd.	12 parts.
Cinnamon, powd.	12 "
Nutmeg, powd.	3 "
Sugar of Milk, powd.	48 "
Sugar, powd.	96 "

Triturate the resin of podophyllum with the sugar of milk for fifteen minutes; then add the other ingredients and mix thoroughly. Keep the mixture in well-corked bottles. *Dose:* one teaspoonful.—*Amer. Drug.*

Crotonized Ether.

Croton oil	1 fl.	ʒ
Ether	1 fl.	ʒ Mix.

Dose: twenty drops in an ounce of cold water with a little sugar, to be repeated in an hour, if necessary. Recommended as a remedy for habitual costiveness.

Olive Oil Trade of Bordeaux.

CONSUL ROOSEVELT reports as follows concerning the olive oil trade of Bordeaux:—

"The commerce in olive oil at the port of Bordeaux is constantly on the increase, and as the United States is one of the largest receivers of this article, it will not be uninteresting to consider a few of the leading facts respecting its production, the process of refining it, and the value and price of oils exported.

"The best quality of crude oil comes from the olive orchards in the vicinity of Nice and the north of Italy, where it is pressed from the olives by very primitive machinery. It is then shipped to Bordeaux in large hogsheads and sold in bulk to the various refiners at prices which vary according to the year's production and the demand; after which it goes through the ordeal of refining, bottling, and labelling, and is then put on the wholesale market at from fifteen to twenty-eight francs per case of one dozen bottles.

"There are five or six firms in Bordeaux which have met with great success in the trade, and each has its special process for refining. These processes are merely a succession of filters made of a variety of materials, such as felt, canvas, etc., through which the oil passes at an even temperature, the quality being materially affected by a variation of a few degrees, either higher or lower, and it is the labor of refining which augments the price of the oil.

"The bottles contain from sixteen to eighteen ounces, and the half bottles from eight to nine ounces each.

"The total value of oil shipped to all countries from this port in 1879 was $1,088,115.27; and in 1880, $1,180,782; and of that shipped to the United States in 1879 was $149,327.86; and in 1880, $163,903.72; showing an increase of $82,667.27 in total exports, and $14,575.86 on exports to the United States."—*U. S. Consular Reports.*

Manufacture of Raisin Wine.*

EVER since the first appearance of phylloxera in the vineyards of France, those directly interested in grape culture, and many others indirectly interested in this leading industry, have been steadily at work seeking to discover some effective method by which the ravages of these destructive insects could be stopped. The government, and also the several agricultural societies, have not been backward in offering large premiums for this purpose. But it must be confessed that so far nothing has been found that, to any appreciable extent, accomplishes the end sought. Remedies applied vary widely in effect, according to the soil and climate; some cannot be used, owing to the formation of the ground, and some applications that are sure death to the insect unfortunately kill the vine at the same time.

The best evidence of the failure in finding the desired remedy, lies in the statement of wine production in France for the last five years:

	Hectoliters.
1876	41,846,748
1877	56,406,363
1878	48,720,553
1879	25,769,552
1880	29,677,472

The highest production, that of 1877, was, by several millions of hectoliters, less than the average of previous years.

The effects of this great decrease in a staple production have been particularly felt in this region of France, which has suffered more than any other section from the ravages of the phylloxera. Hence, a notable decrease in the exportation, accompanied with a large increase of importation.

The imports of wine at this port amounted, in the year 1880, to 46,020,441 liters, while 14,407,918 litres only were exported. In addition to the enormous importation above quoted, we must take into account the novel product called "*Vin de raisins secs*," wine made out of raisins.

The importation of raisins and dried currants at this port reached the unprecedented figure of 36,394,527 kilograms in 1880.

Although there is no reliable basis for the assertion, it may be safely presumed that not one-tenth of this quantity was used for ordinary purposes. Indeed, all the raisins or currants coming from the East, viz., over 30,000,000 kilo grams, may be confidently said to have been used in the preparation of this "raisin wine."

If it be taken into consideration that 100 kilograms of raisins are capable of yielding 325 liters of wine, a sufficiently accurate idea can be formed of the quantities of wine that have been manufactured in this way at this place alone.

Having had occasion to examine a book, published by Mr. F. J. Audbert, of this city, on the art of making wine out of raisins, I was surprised to see that the process employed does not differ from that of manufacturing ordinary grape wine. Indeed, it is assumed that the grape, in going through the process of desiccation, loses none of its original elements save the water, which enters into and forms about 80 per cent of its composition. By restoring this lost water, the raisin becomes capable of yielding the same liquor as before it was dried.

This point being accepted as a principle, the raisins are carefully cleansed and freed from all impurities, and then allowed to soak in a tub with a quantity of water equal to the quantity of wine that is to be manufactured; the water must be as pure as possible, distilled water being preferable.

As above stated, a certain quantity of water generally gives an equal quantity of wine; there are, of course, limits to this quantity, and the quality varies according to the amount of water used. This is the statement given by Mr. Audbert; in that respect the French degree of wines of *liqueurs* represents the exact percentage of alcohol; thus wine of 20° contains 20 per cent of pure alcohol.

One hundred kilograms of raisins soaked in 150 liters of water yield wine at from 18° to 22°; in 175 liters of water, yield wine at from 15° to 18°; in 200 litres of water, yield wine at from 13° to 15°; in 225 liters of water, yield wine from 12° to 14°; in 250 liters of water, yield wine at from 11° to 13°; in 275 liters of water, yield wine at from 10° to 12°; in 300 liters of water, yield wine at from 6.5° to 10°, according to quality and origin of raisins used.

The time during which the raisin is to soak is from forty-eight to fifty hours in winter, and about forty hours in summer.

In all cases it must be carefully stirred, and is sufficiently soaked when it has resumed the appearance of a fresh grape, and when being pressed between the forefinger and the thumb it breaks with a report. This being done, the usual course for the preparation of wine is strictly followed, little more care only being wanted.

The raisin is crushed in the usual way and placed in the fermenting tub, being well stirred at the beginning, so as to separate the grains from each other and start a regular fermentation.

The "must" is to be kept at a temperature of 15° centigrade, at least, and the cellar at an invariable temperature of from 15° to 20° centigrade. When properly conducted, the fermentation should be completed in twelve days, and the raisin wine is then ready to be drawn and lodged in casks, going through the customary processes of sulphuring, clarifying, etc.

The wine is then claimed to be composed of exactly the same principles as fresh grape wine, but differs from it by its color, as it is always white, or, at best, straw-colored. The wine of this region is dark-red, strongly alcoholized wine; therefore the raisin wine, in order to be easily disposed of, must be colored by artificial means, and here is where it may, in the hands of unscrupulous traders, become a danger to the consumer. Some of the dying stuffs used for that purpose are poisonous in the extreme, or otherwise injurious to health, and it must be said that the local au-

* By H. A. Taylor, U. S. Consul at Marseilles. Commercial Relations of the U. S.—Reports from Consuls, January, 1882, p. 80.

thorities are especially watchful in this respect. Scarcely a week passes without some wine thus adulterated being condemned by superior order and poured out into the sea.

The raisin wine is also largely used in its natural state, that is to say, without being colored by artificial means, by simply mixing it with red wines that are so deep in color that the adjunction of a certain quantity of raisin wine really improves both.

At all events, this industry is now thriving, and when honestly followed is undoubtedly beneficial to the country in which the use of wine has become so general as to be almost indispensable.

The central administration, which at first frowned on it, and even going so far as to denounce the manufacture of raisin wine as an offence, and making the manufacturers liable to a prosecution for falsification of wine, has now and for some time past entirely changed its view of the matter. All the petty hindrances opposed in the beginning to this branch of industry have been removed, and at this day there is no distinction made between the raisin and the grape wine, both products being submitted to the same charges and duties, and in fact recorded under the same head in all the official books and returns.

I see no reason why the manufacture of raisin wine cannot be successfully carried on in the United States as well as here. Raisins can be purchased there nearly as cheap as here, the duty being but two and one-half cents per pound. The process of manufacture is simple, not requiring much machinery, neither a large expenditure of labor.

I believe that vast benefits would arise to our country by the production there of cheap wines to take the place of stronger and more harmful stimulants.

Reihlen's New Method of Wine-Making.*

IT is well known that the art of making wine according to the old method practised over one thousand years ago, although for the most part still in vogue, is no longer adapted to the requirements of the present day. Owing to the various diseases to which the vine has of late become prey, grapes have increased considerably in value, so that it is of great importance to get the utmost out of them. By the old method, a very considerable quantity of valuable substances to which wine owes its aroma, body, and color, remain in the marc after musting.

Adolph Reihlen, of Stuttgart, has patented a simple and profitable process which opens a new era in wine industry, because it affords a means of thoroughly utilizing the grapes. An increase in the percentage absolute quantity of wine produced is attained, without, as in the case of Petiot's and Dr. Gall's method, affecting the quality of the wine.

Reihlen operates as follows: The berries are gently pressed, the must heated to boiling, and the marc mixed with the boiling must for three or four minutes, whereby the coloring matters, tartar, aroma, and other valuable substances are extracted, and at the same time the injurious albuminous substances are rendered insoluble. The marc is, however, not quite exhausted by this process, but is capable of imparting the rest of its still valuable contents to weak wines, so-called fruit wines, and saccharine liquids generally. By Reihlen's method (which has been in operation since 1880), when purple grapes are worked up for wine, a deep bluish-red must is obtained in a few minutes without fermentation, the quantity of coloring matter extracted by the boiling must being from three to seven times as much as that extracted according to the old method after three months' fermentation. Reihlen further prepares the marc of purple grapes in such a way that even after years this will impart a color to red wines which have become bleached, or revive the taste of deteriorated wines.

What has been said about red wines applies equally to white wines, and the bouquet peculiar to the Riesling and Traminer grapes admits of being imparted to the must from other kinds of grapes. Another peculiarity of Reihlen's process consists in using the carefully edulcorated grape-skins which are taken out while hot, drying them, and using them as a ferment. Reihlen states that grape-skins prepared in this way excite in must and in sweetened old and young wines, a fermentation of the sugar without any formation of yeast. The explanation of this apparent anomaly may be, perhaps, found in the theory that the ferment adheres very closely and persistently indeed to the skins, and the molecules of sugar being only brought in contact with it by means of the circulation of the liquid caused by the formation of alcohol and heat of fermentation. It then appears that the ferment is possessed of an extraordinary power of splitting up sugar. The result of these mutual combinations is, that the fermenting wine always appears clear.

Wine authorities are of one mind as to the value of Reihlen's discovery, and it seems likely that wine-making according to this method will soon become universal. The Œnological Institute in Stuttgart is now testing the matter.

* *Wiener Freie Presse. Chem and Drugg.*

Modification of Pettenkofer's Test for Biliary Acids.

E. DRECHSEL recommends the following modification: Add to the solution of the biliary salts (with alkalies), which should be as concentrated as possible, and should be contained in a test-tube, syrupy phosphoric, instead of sulphuric acid, until the whole liquid appears to be somewhat syrupy. Next add a little cane sugar, and heat the test-tube by setting it in the neck of a flask containing boiling water. After a short heating, the characteristic red or red-violet color will make its appearance, even if only traces of biliary acids are present. At the same time, it is not necessary to avoid the addition of an excess of cane-sugar.—*Journ. f. prakt. Chem.* (N. F.), 24, 44, and *Zeitsch. f. anal. Chem.*, 1882, 150.

Note by ED. N. R.—We find that the above reaction succeeds best in the following manner: Put about 5 *cc.* of syrupy phosphoric acid in a test-tube, add 2 drops of a fresh solution of cane-sugar (1 : 4), and afterwards 1 drop of the solution containing biliary acids. This solution may be quite dilute. Fresh ox-gall, diluted with fifty times its volume of water, will give the reaction very nicely. (We have not ascertained the limit of delicacy.) Then set the test-tube in the neck of a flask containing boiling water. In a very short time, the surface of the liquid in the test-tube will assume a rosy tint, which will permeate the remainder of the liquid, but will always be a little darker near the surface, where air is present. The tint of the liquid will gradually darken, and finally become scarlet or claret-red.

Cold Cream.

1. Oil of almonds, expressed	1¾ oz.
Spermaceti	½ troy oz.
White wax	1 dram.
Rose water	6 drams.
Glycerin	2 "
Borax, in fine powder	1 dram.

Melt the oil, spermaceti and wax together by means of a water-bath; then add gradually the borax dissolved in the glycerin and rose water, stir constantly while cooling, and add a few drops of the oil of rose.

2. Golden salad oil	3½ ounces.
Spermaceti	1 ounce.
White wax	2 drams.
Borax	q. s.
Rose water	2 ounces.
Oleic acid	20 drops.
Oil of rose	q. s.

Melt together by means of a water-bath, the oil, spermaceti and wax; then gradually add the rose-water, in which a small quantity of borax has been dissolved and stir the mixture. The oleic acid is then added drop by drop, with constant stirring. When nearly cold, add a few drops of the oil of rose.—FRED. GRAZER, PH.G.*

* From *Notes on the Ointments of the Present and Proposed Pharmacopœias*, in *Proceed. of the California Pharm. Soc. and Coll. of Pharm.*, 1882.

Iodoform.*

THE recent periodical stir which iodoform occasioned in medical circles is about subsiding. This decadence is further hastened by several adverse reports of its action with fatal termination. But that iodoform will share the deserved neglect of ethyl bromide is, however, doubtful. When carbolic acid, chloral, and the salicylates were first introduced, the excitement was also damped in each case by serious and even fatal consequences following their injudicious or reckless use. The value of these agents is now so well attested that experienced practitioners would no more hesitate in their administration than they would shrink from the application of chloroform and ether, although their evil results in practice are occasionally recorded. It is thus with iodoform: that this substance possesses merits, and even great merits, especially as a local remedy, is amply shown by the fact that the recent agitation over it is the third one already since its appearance in medical history, although no new properties have been discovered in it. A serious objection to its more general use is its objectionable odor, which, though not unpleasant in itself, is disliked by many. In view of these various facts, favorable and otherwise, it may be safely predicted that iodoform has secured a lasting foothold in the domain of physic.

Chemically considered, iodoform is remarkable for the fact that it can be obtained from so many different substances, and doubly remarkable that the yield in all cases is vanishingly small. It has taxed the ingenuity of manufacturers to invent a method for its production in which less than seven-eighths of the iodine employed is directly wasted. With the purest attainable alcohol, the iodoform product does not exceed one-eighth the weight of the iodine used. With an alcohol less pure, that is contaminated with aldehyde and amyl alcohol, the result equals one-sixth of the iodine used. But with wood spirit, which contains a large proportion of acetone, a yield equal to one-third of the iodine is said to be obtained. It appears, therefore, that alcohol is, in reality, the least economical, and acetone the most. These results are readily inferred from the composition and structure of the bodies involved. In the case of alcohol, which is derived from the methane molecule by the substitution of two hydrogen atoms by a methyl and a hydroxyl group, one molecule of iodoform and one molecule of formic acid are obtained. The methyl group is consumed in the formation of the iodoform, and the residue, after the deprivation of an atom of hydrogen, is converted into formic acid by the assimilation of an atom of oxygen. The formic acid is derived from the methane cluster by the replacement of three hydrogen atoms by one oxygen atom and one hydroxyl group: it therefore embodies the central carbon atom of the alcohol molecule. In the case of aldehyde, which is a derivative of methane from the substitution of three hydrogen atoms by an oxygen atom and a methyl group, one molecule of iodoform and one molecule of formic acid are also produced, but the methyl residue alone is separated and replaced by a hydroxyl; the central carbon again generating the formic acid. In the case of acetone, which is a derivative of methane by substitution of all four hydrogen atoms by one oxygen atom and two methyl groups, two molecules of iodoform and one of formic acid are generated, the two methyl residues being simply replaced by one hydroxyl group and one hydrogen atom. Thus it will be seen that whilst the alcohol yields a methyl residue to the iodoform product, it likewise abandons a hydrogen atom requiring oxidation, and in addition absorbs an oxygen atom. But the aldehyde, whilst generating the same amount of iodoform, gives up only a methyl group in exchange for hydroxyl. And the acetone, whilst yielding twice the amount of iodoform, parts with two methyl groups for a hydrogen and a hydroxyl. From this it is easily seen why alcohol produces comparatively little, and acetone comparatively much iodoform.

In the manufacture of chloroform, the proportion of product from a given quantity of alcohol is the greatest attainable. For bromoform it is presumably less, and for iodoform it is known to be least. These results are due to the respective affinities of chlorine, bromine, and iodine for hydrogen and oxygen. Experiment shows, and the periodic scheme indicates, that chlorine forms the strongest unions with hydrogen and the weakest with oxygen, but that iodine combines more firmly with oxygen and less so with hydrogen, and that bromine in these regards stands midway between them. Thus it is that chlorine readily liberates bromine and iodine from their saline combinations, but that iodine as promptly expels chlorine from its oxygen compounds, as instance the formation of potassium iodate by the action of iodine on potassium chlorate. In the reaction between alcohol and chlorinated lime no formic acid is ultimately found, because the chlorine in its superior tendency towards hydrogen rejects enough oxygen to convert all the formic acid forthwith into carbonic acid as calcium carbonate. This effect accounts for the large proportion of chlorine gained for the objective compound.

In the manufacture of iodoform, the reaction between iodine, alcohol, and alkali results chiefly in the generation of iodic acid and corresponding amounts of iodhydric acid. The small product of iodoform is readily accounted for on the superior affinity of iodine for oxygen. Hence, since the disruption of alcohol requires oxidation, and also adds hydrogen for further oxidations, the difficulty of obtaining an available amount of oxygen for a large yield of iodoform becomes apparent. And therefore it is why aldehyde, and especially acetone, which require no further oxidation in themselves, and also part with less hydrogen requiring it, produce iodoform more plentifully.

One of the earliest methods of preparing iodoform consists in treating an alcoholic solution of potassium iodide with chlorinated lime. In this process, the bulk of the iodine is oxidized into iodic acid. Another way was to heat tincture of iodine with caustic alkali. More recent methods, however, are all based upon heating a mixture of various proportions of iodine, alcohol, carbonated alkali, and water. In the use of this process, it was soon ascertained that an excess of alkaline carbonate is not injurious, but, on the contrary, is really essential; in the presence of excess of iodine, either no reaction occurs at all, or only a barely appreciable one. This was the fault with the writer's experiment when using disodic carbonate and borax. Disodic carbonate, in large excess, is actually the best form of alkali to be employed. Borax, although generating iodoform in peculiar compact crystals, is not very serviceable, since a high heat is necessary, and acid vapors are copiously evolved. Acid carbonates, as, for instance, monopotassic carbonate, are also inactive until heat has expelled the excess of carbonic oxide and reduced them to normal salts. In the application of dipotassic carbonate, not in excess, the carbonic oxide liberated during the course of the reaction, cannot accumulate upon the monocarbonate, and produce bicarbonate, because the heat prevents the formation of the latter by throwing the gas entirely out. But, when an excess of the monocarbonate is present, and only moderate heat is used, no gas is evolved, although the usual crop of iodoform is gathered. With sodium monocarbonate, whether in excess or not, no carbonic oxide is evolved, since enough heat cannot be retained in the aqueous liquid to decompose the bicarbonate which has resulted. Hence it is why, in connection with sodic monocarbonate not in excess, no reaction does occur. The only disadvantage there is in the employment of sodium carbonate comes from the sparing solubility of the bicarbonate, especially in the presence of alkaline chlorides, bromides, and iodides. This annoyance can, however, be suppressed by either diluting the solution, straining off the crystals after cooling the hot solution decanted from the iodoform, or adding caustic soda to regenerate the normal salt. The advantage of sodium over potassium carbonate is that, whilst it yields iodoform with equal facility, it is purer and much cheaper, even after considering the higher equivalent weight.

Owing to the large absorption of iodine in wayward compounds, the writer suggested the substitution of bro-

* By R. ROTHER, in *The Pharmacist*, February, 1882.

mine to take its place in this capacity; but since the formation of bromiodoform was apprehended, its application was not attempted. Attention was then directed to the recovery of the wasted iodine. The addition of chlorhydric acid rendered a portion of this again available, and a further treatment with potassic pyrochromate recovered nearly all of the remainder. On adding iodine and alcohol sufficient to keep up the uniformity of iodoform product, the process was thereby made continuous.

On the large scale, chlorine directly applied possesses the greatest advantages. By passing a slow but constant current of chlorine gas into the warm alkaline mixture, iodoform is continuously generated, and, after the operation has endured three or four days, nearly all of the iodine is converted into iodoform. For smaller operations this method is not applicable, but a similar, yet much more expeditious process results by using bromine in place of chlorine, but in dilute aqueous solution, added to the warm mixture at short intervals, or poured into it in a thin but constant stream. Some escape of bromine vapor will, however, happen, and, therefore, the process must be conducted under proper ventilation. In order to get a moderately concentrated aqueous solution of bromine, the aid of sodium or potassium bromide must be obtained. Bromine will dissolve in its own weight of water in the presence of half its weight of potassic bromide. Some heat is generated, showing that a kind of chemical combination results. Addition of water to this solution produces a turbid mixture, but no bromine seems to be deposited. For use, a much weaker solution is needed, and, therefore, one part of bromine must be dissolved in at least eight times its weight of water, with the aid of half a part of potassium or sodium bromide. When a strong solution of bromine is added to the liquid decanted from the first yield of iodoform, a violent effervescence of carbonic oxide results, but, when a weak solution is used, no gas is evolved. In either case, the iodine is profusely precepitated. The evolution of carbonic oxide appears to result from the decomposition of the formic acid by the bromine. This result is advantageous when, after the discontinuance of the process, it is desirable to recover the bromide in the residue. After the iodine has been removed by bromine, an excess of the latter will also destroy the formate. A solution will be obtained which, besides a small proportion of iodate, will contain only bromide and bicarbonate. The bicarbonate is readily eliminated by reason of its sparing solubility, and finally a pretty pure bromide may be secured, especially when the base employed was potassium. In this connection, it was also ascertained that bromine cannot be used in the start to supplant the iodine in the waste products, since no iodoform resulted whilst free bromine was present; furthermore, the alcohol was also attacked too energetically. This property of the bromine to oxidize the alcohol, however, becomes advantageous in the process where dilute bromine is added to liberate the iodine; in this operation, the iodoform is appreciably augmented.

In all processes, a large excess of alcohol added at once is objectionable, since it not only impedes the reaction, but likewise causes much iodoform to remain in solution. In all cases, the iodine should be added gradually, since the greater the immediate excess of alkali, the more rapid is the generation of iodoform.

One of the most convenient, expeditious, and economical processes for continuance, consists in the use of solution of chlorinated soda to free the iodine. This yields iodoform abundantly, and what iodine is wasted, passes wholly into the condition of iodate; which latter may again be reduced, when too largely present, by adding chlorhydric acid, whilst the solution contains also iodide.

The bromine process, when the greatest possible amount of the iodine is to be consumed in one operation, is as follows:

Take of

Iodine	4 troy ounces.
Sodium carbonate, cryst.,	
Alcohol,	
Bromine,	
Sodium or potassium bromide,	
Water	Of each sufficient.

Into a convenient vessel, a flask, evaporating dish, or best, a deep enameled kettle, place 16 troy oz. of crystallized sodium carbonate, 4 fl. oz. of alcohol, and 24 fl. oz. of water. Apply heat, and gradually add the iodine, about ¼ oz. at a time, until the whole is incorporated. When the dark color of the solution has been discharged, set the mixture aside to cool. Now add 8 troy oz. of bromine to 4 troy oz. of potassium or sodium bromide, and 4 pints of water, contained in a bottle, and carefully agitate the mixture until the bromine has dissolved. Pour this solution gradually, and at short intervals, into the iodine mixture, having in the mean time added 2 fl. oz. of alcohol and 8 troy ounces of sodium carbonate. Apply heat until the color has vanished, decant the clear liquid from the iodoform sediment, rinse this upon a filter, wash it with water, and expose it in the open air to dry. If, on heating the mixture for a moderate time, the color should not promptly disappear, more sodium carbonate must be added, when immediate decolorization will result. The quantity of bromine will suffice for a triple liberation of the iodine from the bases, and hence the later intervals of addition must be extended in accordance whilst the heating is in progress.

Manufacture of Ammonia from the Atmosphere.

A process for the manufacture of ammonia from the nitrogen of the air, invented by Messrs. Rickman and Thompson, encourages belief that this often-attempted problem has at last approached a practical solution. The process is based on the deoxidizing of air by coal dust in the presence of water vapor at a full red heat, the water being simultaneously decomposed and yielding hydrogen, which combines in the proper proportion with the nitrogen thus set free. Common salt is introduced with the coal into the furnace wherein the reactions are effected, which at the bright red heat maintained is also decomposed. The free chlorine from the salt combines with the nascent ammonia, forming therewith ammonium chloride. The ammonia being thus combined, it does not decompose under the action of the heat as would otherwise be the case. Should this process prove as practicable as has been anticipated, ammonium chloride will be furnished at a cheap rate and in large quantities, and will have great influence upon the future of artificial fertilizers.

Test for Glucose in Urine.

L. S. Oppenheimer, M.D., of Seymour, Ind., gives in the *Louisville Medical News* of November 26th, 1881, a modification of Prof. Haine's test for grape-sugar in the urine: One or two drops of glycerin are dropped into a test-tube; a few drops of an aqueous copper sulphate solution are added, then about five or six times this quantity of liquor potassa is poured in and the whole boiled. The urine is then gradually dropped in, and if sugar be present, the yellow or reddish color will suddenly appear.

Flour Paste.

Flour	4 ounces.
Water	1 pint.
Nitric acid	40 minims.
Oil of cloves	5 "
Carbolic acid	5 "

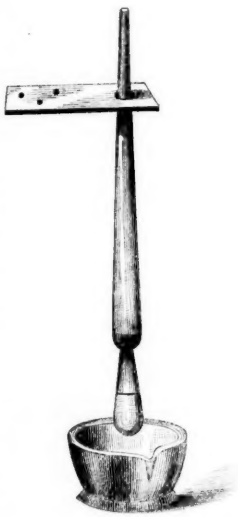
Thoroughly mix the flour and water, strain through a sieve, add the nitric acid, apply heat until thoroughly cooked, and, when nearly cold, add the oil of cloves and carbolic acid.

(This makes an excellent paste for all pharmaceutical uses The addition of about 5 per cent of glycerin is of advantage in places where the atmosphere is usually dry, to prevent the paste from drying up in the pot).—E. W. Runyon.

An Aid in Triturating Milk-Sugar Preparations.

THE length of time required for the thorough comminution of some of the milk-sugar triturations makes the use of the ordinary wedgewood mortar and pestle tiresome, and often leads to shortening the process to the detriment of the product. To overcome this difficulty I have for a long time used an appliance which I became familiar with so far back as 1859 and '60, when preceptors taught more practical materia medica than "germ theory." How long the apparatus had been in use before that time I do not know; and no one to whom I have shown it had ever seen one like it. Mohr & Redwood describe an apparatus constructed on the same general plan, but which is rather more expensive and less adapted to general use.

It consists, as shown in the illustrations, of an ordinary mortar and pestle, the latter having been lengthened by cutting down the mushroom top of the handle, so as to admit of its being inserted into the large end of a stick of wood shaped somewhat like a ball-club, and between two and three feet long. The upper end of this latter stick should be about an inch in diameter, and during the use of the pestle is to be kept upright and steady by passing through an opening in a piece of heavy pasteboard or wood which may be tacked to the under side of some convenient shelf. In the one with which I used to practise pharmaceutical gymnastics, the mortar stood on a shelf about three feet from the floor, and the upper end of the pestle passed through a shelf above. To stop the thumping of the pestle against the sides of the opening, a piece of sole leather was attached to the under side of the shelf, and the pestle passed through a hole in its centre. This also served another purpose, viz., when it was necessary to raise the pestle to admit of changing or stirring the contents of the mortar, the leather would nip the enlargement of the handle so as to suspend the pestle securely out of the way of the hands.



In using the apparatus, one hand grasps the handle just above its lower end, and a very slight effort is requisite to give it the necessary motion. The weight of the stick is usually just about sufficient to insure a proper degree of friction. If, however, more pressure is desired, the pestle can be weighted by slipping a perforated weight on to an iron pin driven in the top of the handle.—ED. N. R.

Reactions for Iron and Copper.

FOR iron, the author finds the limit of visible reaction with potassium ferrocyanide 1 part in 500,000; with potassium sulphocyanide, 1 part in 1,600,000; and with tannic acid, 1 part in 350,000, the limit in this latter case being indistinct. For copper, with ferrocyanide, the limit is 1 part in 200,000 of water; with ammonia, 1 part in 25,000, and with potassium xanthogenate, 1 part in 900,000 of water. For silver, with potassium xanthogenate, the limit is 1 part in 40,000 of water. For mixtures of ferric and cupric salts, with potassium ferrocyanide, the blue reaction was faintly perceptible in a mixture of 3½ vols. cupric and 1 vol. ferric solution, each containing 1 part metal in 100,000 water. With ammonia, the blue reaction was first perceptible in a mixture of 1 vol. cupric and ½ a vol. ferric solutions, each containing 1 part metal in 10,000 water. If the iron is in larger proportions, there appears merely a yellow coloration. On these limits of reaction, the author founds an approximate method for the determination of iron and copper.—A. WAGNER, in *Scient. Amer.*

How to Make Peppermint Drops.

TAKE a convenient quantity of dry granulated sugar, place it in a pan having a lip from which the contents may be poured or dropped; add a very little water, just enough to make the sugar a stiff paste, two ounces of water to a pound of sugar being about the right proportion; set it over the fire and allow it nearly to boil, keeping it continually stirred; it must not actually come to a full boil, but must be removed from the fire just as the bubbles denoting that the boiling point is reached begin to rise. Allow the syrup to cool a little, stirring all the time; add strong essence of peppermint to suit the taste, and drop on tins, or sheets of smooth white paper. The dropping is performed by tilting the vessel slightly, so that the contents will slowly run out, and with a small piece of stiff wire the drops may be stroked off on to the tins or paper. They should then be kept in a warm place for a few hours to dry. If desired, a little red coloring may be added just previous to dropping, or a portion may be dropped in a plain white form, and the remainder colored.

There is no reason why peppermint alone should be used with this form of candy, but confectioners usually confine themselves to this flavor. Any flavor may be added, and a great variety of palatable sweets made in the same manner. If desired, these drops may be acidulated by the use of a little tartaric acid and flavored with lemon, pineapple, or banana. In the season of fruits, delicious drops may be made by substituting the juice of fresh fruits, as strawberry, raspberry, etc., for the water, and otherwise proceeding as directed.—*Confectioner and Baker.*

The Importation of Opium into China.*

THE following information is taken from a report published last year by Mr. Robert Hart, Inspector-General of Imperial Maritime Customs of China at Pekin last year.

About 100,000 chests of opium are annually imported into China. Each chest averages about 100 catties, the catty being equal to about 1⅓ pound avoirdupois. The importation is, therefore, equal to about 13,000,000 pounds. The opium being boiled down and prepared, loses about thirty per cent before it is sold for smoking.

The opium pays import duty and other taxes, in all amounting to about 1 taël per catty (the taël is equal to 6*s.*).

The average smoker consumes about $\frac{6}{5}$ ounce daily, costing him for foreign opium about 10¾*d.*

The native product sells for one-half the price of the foreign drug. As to the quantity of native opium produced, it is impossible to obtain reliable statistics, but assuming it to be equal in quantity to the foreign opium imported—and Mr. Hart does not believe it to exceed this—and reckoning the population of China at 300,000,000 (and it is probably greater), it would appear from the average already quoted that not more than 2,000,000 of the population, that is two-thirds of one per cent, are opium smokers.

The average quantity consumed is believed to be about accurate; if it is under-estimated, there is a smaller percentage of smokers; if it is over-estimated there are more smokers, but less harm is done.

If the native production is ten times what has been calculated, the total would not suffice for the consumption of four per cent of the population.—*Chem. and Drugg.*

* Condensed from the Journal of the Statistical Society, December, 1881.

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PROFESSOR PALMER in this brochure summarizes the facts relating to the assumptions and practices of so-called homœopathic physicians for the benefit of the non-professional reader, and in the course of his writing calls attention to the fact that in Europe the influence of the sect has nearly ceased, while in the United States it has flourished, and its adherents have greatly increased in numbers. To our minds this fact is easy of explanation. In continental Europe, the medical profession have not ostracized the believers in the therapeutic power of infinitesimals, and they have simply been looked upon as persons holding unusual and somewhat remarkable views regarding the action of remedies. In this country and in England, physicians who do not believe in homœopathy have resorted to every measure to ridicule those who are believers and, as far as possible, cut them off from professional associations. The result has been to awaken a popular prejudice in their behalf. The time has come for Professor Palmer and others similarly disposed to change their plan of treatment. It has not, so far as we can detect, had the slightest effect in the way intended, but has resulted most disastrously for everybody but the "homœopaths."

A CLINICAL HAND-BOOK OF THE DISEASES OF WOMEN. By W. SYMINGTON BROWN, M.D. New York: William Wood & Co., 1882, pp. 247, 8vo.

LIKE most works of this sort condensed from larger treatises a relatively large amount of space is devoted to affections and operations that are comparatively rare, while the more common affections, which usually most trouble the general practitioner and student, receive too little attention to make the work of any special value.

THE MATTHEWS CATALOGUE OF CARBONATED BEVERAGE APPARATUS.

THIS beautiful piece of book-work is issued in the fiftieth year of the establishment of this widely known house. To suit the size of the work, most of the illustrations have been newly made, and a number of novelties are published for the first time. Apparently nothing has been spared to make the work one of the most beautiful of its class.

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Juenemann (Dr. Fried.). Die Fabrikation des Alauns, der schwefelsauren und der essigsauren Thonerde, des Bleiweisses und des Bleizuckers. 8vo, Wien, 1882. *m.* 2.50.

NOTES, QUERIES AND ANSWERS.

Under this heading we shall, to the best of our ability, endeavor to answer such questions addressed to us, as come within the scope of this journal, provided they are accompanied by the name and address of the writer. Answers to queries received after the 5th of the month will lie over until the next issue. Unless special instructions to the contrary accompany the query, the initials of the correspondent will be quoted at the head of each answer.

When asking for the formula of an unusual, patented, or proprietary compound, always accompany the query with any information you may already possess regarding the locality in which it is used, its use and reputed effects, in order to enable us to make inquiry without waste of time and labor. When it can conveniently be done, send also a specimen of the label used on packages of the compound.

No. 1017.—**Tincture of Bromide of Iodine** (A. G. S.).

The compound which has occasionally been used under this name appears not to have been a plain alcoholic solution of "bromide of iodine," but a complex mixture of various substances produced by mutual reaction between the ingredients.

1. One formula directs

Iodine	1 ʒ
Bromine	½ ʒ
Alcohol, 95%	14 fl. ʒ
Ether	7 fl. ʒ
Glycerin	2 fl. ʒ
Sodium bisulphite, in powder	2 ʒ

Mix the alcohol and ether, and add the iodine; shake frequently until the latter is dissolved. Now gradually add the glycerin, and, when the mixture is uniform and clear, add the bromine in small quantities at a time, gently agitating after each addition. [This would be what might be called a tincture of bromide of iodine; but its disagreeable odor and staining power have probably been the cause of the attempt to deprive it of color. The directions continue:] Then add the bisulphite, and agitate frequently until the color of the tincture is discharged, which will require several days.

It is said to have been used with benefit as an external application in orchitis, either alone or mixed with an equal volume of fluid extract of belladonna.

2. Another formula directs:

Iodine	1
Bromine	2
Alcohol	30
Distilled water	30

Rub the iodine with a portion of the distilled water, transfer the mixture to a flask, wash the still remaining iodine and solution into the flask by means of the remainder of the water, add the bromine, and shake until the iodine is dissolved. Finally add the alcohol, transfer the solution to small vials which should be filled full, and keep them in a dark place.

No. 1018.—**Manufacture of Yeast** (K. S. K.).

This correspondent desires us to inform him how yeast, in cakes or in granular form, may be made, so that it will keep in hot climates.

Yeast is generally manufactured in connection with brewing or distilling, but it may be made specially by various processes: That which is considered the best is Schubert's. It is as follows:

440 lbs. of rye-flour and 150 lbs. of crushed malted barley are mixed and thrown into a mash-tub containing 50 gallons of water at 131°–140° F. After having been thoroughly stirred up, 1 lb. of compressed yeast, dissolved in water, is added and mixed in. Half an hour afterwards, 70 gallons of water at 165°–194° F. are poured on the mixture, the whole well stirred up and allowed to stand for three hours. The mash is now transferred to a cooling

apparatus, and left there until the temperature has fallen to about 122° C., which requires two to three hours. It is then transferred to a fermenting vat of such dimensions that it will only be half filled by the mash and the water subsequently added. 84 gallons of water are now added to the mash, a portion thereof of such temperature that the whole mixture will be cooled down to 77° F., and the remainder is then immediately heated up to 77° F., and added as quickly as possible. Next, 6 lbs. of pressed yeast, dissolved in water, and 3 lbs. of sulphuric acid, diluted with 24 lbs. of water, are added, the whole well mixed, the tub covered and allowed to stand eight to twelve hours. At the end of this period, the yeast which has collected at the top of the liquid will have acquired the requisite ripeness. A sure sign of ripeness is the appearance of the bubbles collecting on the surface; the further the process progresses, the more opaque they become, until they have a milky appearance. As soon as this is noted, the yeast may be dipped out from the surface, and this may be continued until no more yeast is produced, which may be perhaps after about twenty-four hours. The liquid dipped out is passed through a strainer of bolting cloth, which retains the skins and chaff of the grain, etc. The liquid running from the strainer is collected in a tall and narrow vat, having a series of tap-poles at different heights, and filled about half full with the liquid. Water having been poured in to fill the vat completely, it is left at rest for twelve hours, when the yeast will have settled, and the liquid may be run off. A fresh supply of water, mixed with about 3½ ounces of sulphuric acid and 4 lbs. of potato-starch is run in, and drawn off after twelve hours. The yeast is now collected on a linen strainer, allowed to drain, and mixed, on the strainer, with enough starch-flour to produce a stiff mass. The whole is wrapped in a second, stronger cloth, and subjected to pressure until a solid cake is left. This is then well kneaded and cut into suitable pieces. It may be kept, in its damp condition, for several weeks, if it be kept in a cool place. Or it may be cut into thin slices, and the latter be dried. To prevent spoiling at this stage of the operations, this will probably best succeed by means of a cold-air blower.

A good book on this subject is *Schoenberg: Spiritus- und Presshefe-Fabrikation.* 8vo. Wien (A. Hartleben). 1 fl. 65 kr.

No. 1019.—**Infant's Food** (K. S. K.).

There is no food so adapted for infants as the milk of the mother. In cases where this is deficient, or cannot be used for various causes, the best substitute is fresh, pure cow's milk. We cannot take the responsibility of advising any other kind of food for infants generally, though we readily acknowledge that cases occur where a more solid food becomes desirable. But such cases are the exception, not the rule.

The composition of the different kinds of infant's food sold in Europe, and a method for their analysis, will be found in Hager's Pharmaceutische Praxis. Supplement, p. 892 (Berlin, 1882).

No. 1020.—**Distinction of Invert Sugar and of Glucose** (J. A. A.).

There is no chemical qualitative test to distinguish these two sugars. Invert sugar, as you probably know, is a compound consisting of equal quantities of glucose or dextrose and of fruit sugar or levulose. It is formed by the action of mineral acids upon cane-sugar, whereby the latter takes up one molecule of water:

$$C_{12}H_{22}O_{11} + H_2O = 2C_6H_{12}O_6$$

cane-sugar — 1 dextrose + 1 levulose.

Dextrose turns the plane of polarized light to the right, levulose to the left. But, as the amount of left-rotation of the levulose exceeds the right-rotation of dextrose, invert sugar shows a rotation to the left. According to Soxhlet, 1 cubic centimeter of *undiluted* Fehling's solution is reduced by 0.00494 *gm.* of invert sugar; when diluted with four times its volume of water, it requires 0.00515 *gm.* of the sugar for complete reduction.

The other question cannot be answered at present, but will be kept on file until we may be able to obtain the information.

No. 1021.—**Gelatin-Coated Pills** (E. S. K. and O. F.)

In a small way, pills may be coated with gelatin as follows:

Prepare a solution consisting of 1 part of the finest gelatin and 2 parts of water. This is best made in a water-bath, where it is kept liquid for use. The pills having been prepared in the usual manner, not too hard, but somewhat soft, so as to be readily pierced by a needle, each one is now stuck upon the sharp point of a piece of wire some four or five inches long, the wires being placed for convenience, with the pill-end up, into a tray of sand. When all the pills are mounted, they are dipped one after the other into the gelatin solution, and the wire then replaced in the sand. In about fifteen minutes, the coating will have become dry, when they are taken off the wire, the little hole caused by the point of the wire closed by means of a camel's-hair brush dipped in the gelatin, and the pills then put into a tray to dry

On a large scale, labor-saving apparatus is used. This apparatus, however, is patented, and cannot be used without the consent of the proprietors.

No. 1022.—**Lard Oil and Adulterations** (S. N. J.).

Good lard oil is a pale-yellowish, or nearly colorless oily liquid of a slightly fatty odor and a bland taste. It becomes opaque at or below 32° F. Its specific gravity is 0.900 to 0.920. It is almost pure olein. Any mineral oil present can be detected by the failure of the latter to form soap. The best process is that of A. H. Allen and W. Thomson:

Heat 5 grams of the oil (or fat suspected to contain mineral oils or fats), in a capsule, with 25 cubic centimeters of an alcoholic, 8-per-cent solution of caustic soda. When fully saponified, add 50 *cc.* of warm water, transfer the mixture to a separating funnel of 200 *cc.* capacity, wash the capsule with 20 to 30 *cc.* of water and add this to the liquid in the funnel. Now add 30 to 50 *cc.* of ether and shake. If the mixture does not readily separate, cool the funnel, or add a few *cc.* of alcohol. The ethereal layer contains the unsaponifiable (mineral) oil or fat. If the process is to show the quantity of the adulteration, the extraction with ether must be repeated three or four times. The ethereal liquids, on evaporation or distillation, leave the adulterant behind.

Admixture of cotton-seed oil to lard oil is not readily detected, if the cotton-seed oil was refined and very pale. Any deep-colored lard oil, or one having a pronounced yellow tint would be suspicious. There are no reliable chemical tests either to distinguish the two oils, or to prove the presence of both in one mixture.

No. 1023.—**St. Jacob's Oil** (W. J. T.).

According to the *Pharmaceutische Centralhalle* (see NEW REM., 1880, 148, this is "a good quality of oil of turpentine mixed with a little oil of rosemary and lavender, and colored faintly-red with alkanet or saunders." Messrs. A. Vogeler & Co., of Baltimore, deny the correctness of this statement (see NEW REM., 1880, p. 161), asserting that "not one-half of the constituents are named, and of those named scarcely any entering into its composition." If any of our readers are able to give a better account of it, our columns will be open to them.

No. 1024.—**White Ink** (O. F. R.).

There is really no such article as "white ink." A true ink is a *solution* of some substance or combination of substances in a liquid. Colored liquids, however, may be prepared with various substances not soluble in the liquids available for writing fluids. A "white ink" may be made by rubbing the finest French zinc white, or white lead with a dilute solution of gum arabic. It must be stirred up whenever the pen or brush is dipped into it.

No. 1025.—**Granular Salts** (J. A. A.).

These are prepared either by assiduous stirring during the process of evaporation, whereby the tendency of the solid to form large crystals is counteracted, or by mixing a concentrated solution of a salt into another liquid, generally alcohol, in which the salt happens to be insoluble.

No. 1026.—**Coto Bark and its Preparations** (S. N. J.).

You will find full accounts on coto bark, its constituents, etc., in this JOURNAL, 1876, 39, 104, 360. 1877, 18, 145. 1878, 206, 338. 1880, 10 (see this particularly), 38, 210, 336.

No. 1027.—**Karaka Nuts** (San Francisco).

These nuts are derived from *Corynocarpus lævigata* Forst., a magnificent evergreen with glossy foliage and yellow fruit one inch long. It belongs to the nat. order Anacardiaceæ and is a native of New Zealand. In Victoria it is known as the New Zealand laurel, and it sometimes attains there a height of thirty feet, spreading in proportion. In the dark valleys of New Zealand it often grows to fifty feet and over. Cattle are very fond of the foliage, which is said to be fattening. The flowers are inconspicuous. The fruit and the seed are eatable, but the latter is poisonous in a fresh condition, requiring either to be boiled or to be steeped a few days in water or to be buried in the ground. The poisonous qualities very likely reside in an acrid volatile substance, such as is found commonly in plants belonging to the order Anacardiaceæ. We are not aware that the nut has ever been used medicinally.

No. 1028.—**Lime Juice Cordial** (W.).

In addition to several formulæ heretofore published by us (f. i., 1879, p. 90), the following may serve your purpose:

Lime juice	4¼ gallons.
Oil of orange	1 fl. dram.
" nutmeg	1 "
Water	7 gallons.
Glucose	9 pounds.
Cane sugar	27 "
Salicylic acid	½ ounce.

Dissolve the glucose and cane-sugar in the water, add the lime-juice, the essential oils and the salicylic acid. Mix well and strain.

No. 1029.—**To Restore the Index of a Self-Registering Thermometer** (H. and D., Spartanburg, S. C.).

When the index of a clinical thermometer has united with the main body of mercury, it can sometimes be separated by warming the bulb until the mercury enters a little way into the tube, when, by holding it with the bulb upward, and tapping the tube gently on a table or other solid substance, a fragment may sometimes be detached.

It is, on the whole, better to buy an instrument having a constriction or twist in the tube, which serves to keep the index above this point, while the main body of the mercury recedes.

No. 1030.—**Bully-Tree Gum** (J. N., Westfield, Mass.).

This inquirer desires to know of whom he can purchase bully-tree gum, and its cost. See our January number, page 16. We have also been informed that the article may be bought from Reed & Co., 44 Cedar street.

Calculation of Price from Troy to Avoirdupois Weight, and Vice Versa.

EDITOR OF NEW REMEDIES:—If any pharmacist desires to quickly ascertain the price of any drug in *troy* weight, when the price is known in avoirdupois, the following rule will assist:

Multiply the avoirdupois price, per ounce, by the decimal fraction 1.097. The result will be the price per troy ounce.

The reverse problem is solved by multiplying with 0.9 18.

J. A. ARMSTRONG, PH.C.

SCOITSVILLE, N. Y.

Albany College of Pharmacy.—The first lecture-term of this college closed on the 28th of February. The graduating exercises were held on that day, diplomas being awarded to Albert R. Griffith, Oil City, Pa.; Gustav Kreutzer, of New York, and John S. Phillips, of Fonda, N. Y. The degree was conferred by President Potter, Union University, of which the School of Pharmacy is a branch. David Murray, LL.D., delivered the address. Prizes of $25.00 were awarded to Mr. Griffith for the best thesis, and to Mr. Kreutzer for the best examination in pharmacy. Twenty-one students were in attendance during the term.

NEW PATENTS.

[*Complete specifications and illustrations may be obtained of any one or more of the following patents by sending the number, title, name of patentee, and date of issue, with twenty-five cents for each copy, to the Commissioner of Patents, at Washington, D. C., together with the name and address of the person requesting the same.*]

250,310. *Bottle-cork Fastener.*—James Walker, Cincinnati, O.

9,948. *Packing for Bottles, etc.*—Oliver Long, New York, N. Y. Original number 154,498, dated Aug. 25th, 1874. A packing composed of a sheet of paper fluted or crimped to give it body or elasticity, and another sheet secured to the former to keep it in place.

250,369. *Bottling Machine.*—Frederick C. Lang and Carl Breitenfeldt, Chicago, Ill.

250,416. *Manufacture of Sulphuric Acid.*—Frederick Benker and Henri Lasne, Paris, France. Patented in France Oct. 30th, 1880. The method of economizing nitrous compounds in the manufacture of the sulphuric acid, by mixing sulphurous acid gas with the gases which enter the Gay-Lussac tower.

250,452. *Breast-Pump.*—Daniel C. Perkins, Providence, R. I., assignor of one-half to Joseph Davol, same place.

250,469. *Paper Bottle.*—Alphonso C. Williams, Cambridgeport, Mass

250,500. *Compound Bottling Machine.*—Edward G. Chunning, Norfolk, Va.

250,524. *Process of and Machinery for Refining and Purifying Paraffin and other Waxy Materials.*—Daniel T. Gray, Brooklyn, assignor by mesne assignments to Jno. A. Stoutonburgh, New York, N. Y.

250,653. *Siphon-bottle.*—Albert Fischer, Philadelphia, Pa., assignor to himself and Eliza J. Hutzler, same place.

250,658. *Tooth Brush.*—James K. Griffin, Waterdown, Ontario, Canada.

250,710. *Machine for Manufacturing Pills.*—Wm. N. Clark, New York, N. Y. As an improvement in machines for making pills, the combination, with a suitable frame, of a hinged bed-plate carrying a detachable plate having concentric circular grooves, a vertical shaft carrying a detachable disk having concentric circular grooves, and mechanism for operating said shaft.

251,063. *Bottle Stopper.*—Stephen S. Newton, Binghamton, N. Y.

251,086. *Scale Beam.*—Stephen J. Austin, Terre Haute, Ind. A poise carrying a graduated arm so arranged as to indicate, beside the total, each of several weights.

251,223. *Bottle Stopper.*—C. Otto Hammer, Pittsburg, Pa., assignor of one-half to John H. Barr, same place.

251,343. *Truss.*—William Nelson, deceased, Little Falls, N. Y., Edwin J. Nelson, executor. A truss-pad supported upon or by means of a number of spiral springs, which are placed beneath the same near its periphery.

251,355. *Suppository.*—Edwin H. Gibbs, New York, N. Y. A stoppered hollow suppository formed of butter of cacao or analogous material, and adapted to inclose and hold any desired medicament or nourishment, and to be hermetically sealed by heat.

251,371. *Spirit Thermometer.*—Edward H. T. Liveing, Queen Anne St., Cavendish Square, County of Middlesex, England, assignor to James Joseph Hicks, same place. Patented in England, Sept. 29th, 1880. A thermometer-tube having a dark background and its contained spirit colored with fluoresceine and an alkali.

251,412. *Soda-Water Dispensing Apparatus.*—William P. Clark, Medford, Mass.

251,431. *Abdominal Supporter.*—Ellen C. Glinning, Philadelphia, Pa.

251,455. *Machine for Drawing Corks.*—Andrew Muir, Harborne, County of Stafford, England. Patented in England, Aug. 18th, 1880.

251,512. *Process of and Apparatus for Cooling or Con-*

gealing Liquids and Separating Crystals therefrom.—William Bell, New York, N. Y. The process of congealing paraffin or other liquid and separating the crystals or solid matters therefrom, consisting in passing the paraffin or other liquid over a hollow tube or bed through which circulates a cooling agent, by means of scrapers or blades which keep the liquid evenly distributed, and remove the crystals or other solid matters as they form.

251,525. *Instrument for Opening Internally-Stoppered Bottles.*—Hiram Codd, London, England. Patented in England, March 16th, 1881.

251,577. *Receptacle for Packing Cake or Bar Soap.*—Norman W. Griswold, San Francisco, Cal., assignor to the Royal Soap Co. of California.

251,625.—*Process of Refining and Hardening Lard*—Wm. O'Hara, Chicago, Ill. By adding the proportion of ten pounds of stearin to each one hundred pounds of lard when both are in a melted state, then thoroughly agitating and mixing the same, and finally adding two and one-half ounces of saltpetre to the above proportions.

251,676. *Paint for Roofs, etc.*—Atwater E. Brockett, Branford, Ct., assignor to Lemirah H. Brockett, same place. The paint, or base for a paint, composed of pine tar, resin oil, pure caoutchouc gum, gutta-percha chips, gum shellac, copal (oil) varnish, damar varnish, and boiled linseed oil, or their equivalents.

ITEMS.

College of Pharmacy of the City of New York.—The lecture season just past has been the most successful and one of the most eventful which this institution has seen. The total number of students in attendance has been: Winter-course, 1881–1882, 117 seniors and 179 juniors. Laboratory, 69. Special students in chemistry, or in pharmacy, or in botany and materia medica, 9. Summer classes in botany and pharmacy, 72. The examination of the candidates for graduation took place on March 8th, 9th, and 10th. 102 presented themselves and 83 passed. The junior examination was held on March 6th, and of 158 who presented themselves 105 passed. Those who failed will be entitled to undergo a supplementary examination in September.

The commencement took place on Wednesday, March 22d, at Chickering Hall. As we shall have gone to press before this date, we can for the present only insert the names of the graduating class, together with the names of those who specially distinguished themselves.

Graduates of the Glass of 1881–1882: H. C. Baker, J. Beavers, L. F. Bischof, H. Boeme, H. Bohmfalk, F. Bosch, Jr., C. C. Bradley, J. E. Branigan, W. A. Burrows, H. A. Chapin, J Clarke, G. H. Cooke, G Dahlbender, R. R. Dakin, E. A. Denicke, J. F. Doring, J. Eckert, B. Ettinger, W. V. Everett, F. W. Fenn, F. L. Fieger, L. Fischer, J. P. Foland, R. Gastmeyer, H. Goemann, J. M. Hedenberg, G. O. Heffter, H. E. Hoffmann, P E. Hommell, H. W. Hoops, Jr., W. Hunte, J. H. Hutchens, J. E. Jackson, O. Jantze, W. Johnson, L. H. Lesser, J. Loewenstein, Theo Lutz, J. P. Manck, W. J. McLaughlin, Geo. Minrath, D. R. Morgan, D. C. Moriarta, H. G. Nadler, I. L. Nascher, G. R. Newby, F. O'Connell, P. O'Reilly, W. J. Parshall, J. E. Parsons, C. A. Passmore, E. R. Petty, H R. Purdy, M. Rafter, H. V. Roese, Ferdinand Ruppert, E. M Sedgewick, G. E. Schneider, J. R. Schoonover, E. F. Sickenberger, R. Sieburg, H. N. Siegenthaler, W. E. Simpson, T. A. Smith, W. Stern, G. C. P. Stolzenburg, C. E. Tallmann, C. Teubner, W. H Tyler, A. F. Underwood, A. C. G. Vosseler, O. Wagner, R. Walker, M. L Walters, M. C. Warsaw, F. I. Watkins, F. Wenzel, Jr., G. F. Westbrook, E. Winters, F. Wirth, J. G. Weischerth, J Woelfel, Jr, G. G. Wray.

Certificates of Proficiency were awarded in botany, materia medica, and chemistry, to: DeL. Haigh, H. J. Owens, and in pharmacy to: L. Stollmann.

The prizes were awarded by the Alumni Association as follows: *First prize*, gold medal: H. A. Chapin. *Second prize*, silver medal: D. C. Moriarta. *Third prize*, bronze medal: H. V Roese. *Roll of Honor:* Messrs. Siegenthaler, Fieger, Nadler, Hutchens, Purdy, Everett, Bradley, Westbrook, Walters, Dakin, Boehme. *Roll of Honor of Junior Class:* M. W. Coleman, G. G. Needham, H. J. Simmons all three of equal standing), A. T. Halstead, W. P. Funnell, A. G. Cook, Chas. Blauw, E. H. Barnum, A. Eschmann, A Stover.

The annual meeting of the college and election of officers for the ensuing year took place on Thursday, March 16th. The following officers were elected:

President: Ewen McIntyre. *Vice-Presidents:* 1. Gustavus Ramsperger; 2. H. J. Menninger; 3. G. C. Close. *Treasurer:* Starr H. Ambler. *Secretary:* M L. M. Peixotto. *Trustees:* 1. To serve for one year, being the unexpired terms of Messrs. Ramsperger and Nichols, who resigned: Frank F. Knapp, and Jos. B. Mauch. 2. To serve for three years: Gust. Balser, Adolph Tscheppe, Herbert Hazard, Hermon W. Atwood. *Property Committee:* Wm. M. Olliffe, Theod. Louis, Dan. C. Robbins, J. W. Shedden, Wm. M. Wright. *Committee of Reference:* George D. Coggeshall, C. L. Hohenthal, Wm. P. de Forest. *Delegates to the American Pharmaceutical Association:* G. G. Seabury, M. L. M. Peixotto, T. J. MacMahan, L. M. Royce, Chas. Rice. *Committee on Pharmacopœia:* Chas. Rice, Paul Balluff, H. B. Parsons.

The college has purchased the adjoining property, No. 213 East Twenty-third street, which will permit the speedy organization of a laboratory for instruction in practical pharmacy and the art of dispensing.

Special attention is directed to the summer classes in practical botany under the charge of Prof. Joseph Schrenck. This is the only public course of instruction in botany available in the city and is not confined to those who intend to become pharmacists. Every one who desires to become acquainted with this beautiful branch of natural history should join the classes. Excursions will be made during the summer to the country, and two lectures will be delivered every week, on Wednesdays and Fridays, at the college building, beginning on April 5th.

The Chicago College of Pharmacy.—The fifteenth annual course of instruction in this institution terminated March 10th, the commencement exercises being held at Fairbank's Hall. Notwithstanding the inclemency of the weather, a large audience was in attendance.

The following-named gentlemen were awarded diplomas: F. L. Abbott, Chas. G. Buck, A. F. Burk, C. G. Bitner, E. E. Evans, H. Erlicher, O. F. Fischer, Geo. H. Hartz, E. Horn, Wm. Justi, J. F. Keneagy, C. E. Marshall, F. R. Meadowcroft, H. L. Ohlendorf, Wm Schaetzel, L. C. Standt, Emil Wunderle, Geo. W. Whitfield, Chas. L. Walther, Jacob Walther, Eugene Zimmerman, Ernest Zimmerman.

Mr. Louis Standt, having reached the highest standard of scholarship during the session, received the Faculty prize of a gold medal. The same gentleman also secured the gold badge offered by the Alumni Association to the student standing first in chemistry and botany.

The valedictory address, on behalf of the faculty, was given by Prof. H. D. Garrison, and was replied to in fitting terms by Chas. G. Buck, who presented to the college and also to the president finely executed photographs of the class.

At the conclusion of the exercises, which were interspersed with orchestral music, the graduates were presented with many beautiful floral designs furnished by their admiring friends.

The session just closed has been the most successful in the history of the college. Not only has the attendance largely exceeded that of former years, but the degree of proficiency attained by the students, both Junior and Senior, has been unprecedented. The latter result is mainly due to the system of written term examinations introduced two years ago in this college, and now a permanent feature of its course.

New York State Pharmaceutical Association.—The Committee on Exhibits invite manufacturing chemists, and the trade generally, who wish to exhibit their products at the meeting to be held in Albany, on the 20th and 21st of June next, to make an early application for space.

Please to state what articles are likely to be shown, and the amount of space wanted (in square feet of counter-room), and the Committee will endeavor to allot space to the best advantage.

The attention of exhibitors is called to Article XV. of the By-Laws, which will be strictly adhered to, viz. :

The Association invites manufacturers, and others, to exhibit at the annual meeting crude drugs, chemicals, pharmaceutical preparations, and such objects as possess a general scientific or special pharmaceutical interest.

Proprietary and patented medicines, all medicinal preparations, the complete working formula of which is withheld, and such preparations as are offered under other than their proper scientifically recognized names, will not be received.

Address all communications to the Chairman of the Committee, GEORGE E. FERGUSEN.

70 Madison avenue.

The Woman's Medical College of Baltimore.—A new institution has been incorporated under the above title in Baltimore, Md., of which the faculty are all gentlemen. Eugene F. Cordell, M.D., is the Professor of Materia Medica and Therapeutics, and Robert B. Morrison, M.D., the Professor of Chemistry, Urinary Analysis, and Toxicology. The course of lectures is announced to begin on the 1st of October next, which is rather remarkable, as it will be Sunday.

Proposed State Pharmaceutical Association in Indiana.—Thirty-five well-known pharmacists of Indiana have addressed a call to the druggists of Indiana for a meeting to be held in Indianapolis on the 9th of May next, for the purpose of organizing a State Pharmaceutical Association. All who expect to be present should notify Mr. Jos. R. Perry, 502 E. Washington street, Indianapolis, so that arrangements may be made with railroads and hotels for reduced rates.

California Pharmaceutical Society.—At the quarterly meeting held on the 21st of January, the annual election resulted as follows:

President, Emlen Painter; *Vice-Presidents*, Wm. M. Searby and James Topley; *Secretary*, Fred. A. Grazer; *Treasurer*, Wm. J. Bryan; *Librarian and Curator*, Ph. L. Vreeland; *Editor*, Wm. M. Searby; *Trustees*, Emlen Painter, John Calvert, Fred. C. Keil, John Dawson, D. W. Kirkland, S. A. McDonnell, and F. A. Grazer.

The Trustees of the Society reported forty-seven matriculated students last year, that $1,300 had been received in fees for the year, being the receipts from lectures, matriculation, and diplomas. Of fourteen candidates for the degree of graduate in pharmacy, the following thirteen passed: J. J. Argenti, A. L. Scholle, D. Lustig, M. J. Murphy, W. H. Adair, I. P. Elwert, C. M. Troppmann, N. Cody, D. Fletcher, Chas. Hammit, J. M. De Witt, J. P. Ferrier, and Geo. Chard.

Mr. Emlen Painter, the President, in his annual address related the purchase of a lot by the Board of Trustees, the site having been selected by a special committee. It is situated on Fulton street west of Polk, is 30x97 feet, and cost $2,700. The address also recommended the immediate establishment of a building fund for the permanent improvement of the ground, and the accommodation of the college.

The report of the Treasurer, Wm. J. Bryan, was as follows: On hand, at the beginning of the year, $3,886.54; receipts during the year, $2,055.17; disbursements (including purchase of lot), $4,509 95; balance on hand, $1,434.56.

The several other officers handed in their reports. R. H. Freund, of Vallejo; Geo. R. Walden, of Napa City; W. W. Stocker, of Sacramento; Gardner Kellogg, of Seattle, W. T.; J. J. Argenti, A. L. Scholl, D. Lustig, M. J. Murphy, W. H. Adair, C. P. Elwert, C. M. Troppmann, J. M. De Witt, C. H Hammit, J. P. Ferrier, D. M. Gore, W. F. Hurtzig, and Robt. N. Ball, of San Francisco, were elected to membership, making eighty-five active members on the roll.

John Calvert gave notice that he would offer, at the next meeting, the following:

Resolved, That the funds of the California Pharmaceutical Society and the College of Pharmacy be consolidated.

Mr. S. A. McDonnell read a very interesting paper on quillaiine or extractum quillaiæ exsiccatæ, its uses and advantages, being an expeditious method of preparing instantaneously emulsions of fixed oils, etc.

The following queries were submitted:

1. What is the best process for purifying petroleum benzine for pharmaceutical uses without distillation? Accepted by Fred. Grazer.

2. How can the intense bitterness of gentian root be disguised, say in the form of an elixir or syrup of the strength of one-half troy-ounce of the root to the pint? Accepted by D. W. Kirkland.

3. To what extent is the manufacture of cream of tartar, borax, sal soda, etc., carried on yearly in the State of California? Give a statistical report. Accepted by Adolph Sommer.

4. Is there sufficient demand for a preparation called liquor hydrastis or liquor of golden seal? If so, give a formula for the same, and its medicinal advantage over a preparation containing alcohol. Accepted by E. W. Runyon.

5. What is the poisonous principle of the plant known as a species of Astragalus, or commonly called Loco weed? Accepted by C. M. Troppman and Fred. Grazer.

FRED. GRAZER.
Secretary.

PHARM. CALENDAR FOR APRIL.

N. B.—The officers of Societies, Colleges of Pharmacy, Pharm. Associations, etc., will oblige us by forwarding schedules of their meetings, lists of officers, and any changes that may be desirable.

Date.	Society Meetings.
Mon. 3d.	Erie Co. Pharm. Asso.—Meet at Buffalo.
	Pittsburg Coll. Pharm.—Quarterly Meet.
	National Coll. Pharm.—Annual Meet.
Tues. 4th.	Philadelphia Coll. Pharm.—Trustees' M.
	Maryland Coll. Pharm.—Trustees' M.
	Chicago Coll. Pharm.—Annual M.
	Davenport Pharm. Assoc.—Annual Meet.
	Georgia Pharm Assoc.—Annual Meet.
Thurs. 6th.	New York Coll. Pharm.—Trust. Meet.
	Massachusetts Coll. Pharm.—Trustees' M.
	Louisville Coll. Pharm.—Pharm. Meet.
Frid. 7th.	American Chem. Soc.—Monthly Meet.
Mon. 10th.	Rhode Island Pharm. Assoc.—Quart. Meet. at Providence.
Tues. 11th.	Pittsburgh Coll. Pharm.—Trust. Meet.
	Chicago Coll. Pharm.—Trust. M.
	Massachusetts Coll. Pharm.—Pharm. Meet.
	Kings Co. Pharm. Asso.—Meet. at Brooklyn.
	National Coll. Pharm —Meeting.
Wed. 12th.	New York Board of Pharm.—Meeting.
Thurs. 13th.	Newark Pharm. Asso.—Meet.
	California Pharm. Soc. and Coll. of Pharm.—Quarterly Meeting.
	Louisville Coll. Pharm.—Direct. Meet.
	Philadelphia Coll. Pharm.—Alumni Meet.
	Maryland Coll. Pharm.—Meet.
	New York German Apoth. Soc.—Meeting.
Tues. 18th.	St. Louis Coll. Pharm.—Trust. Meet.
	Philadelphia Coll. Pharm.—Pharm. Meet.
Mon. 24th.	St. Louis Coll. Pharm.—Annual Meet.
Tues. 25th.	Boston Druggists' Assoc.—Meeting.
Thurs. 27th.	Kings Co. Board of Pharmacy.—Meets at Brooklyn.